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ABSTRACT

Directions and materials for 57 mathematical games and activities are provided in this commercially-prepared package. Suggested use is with pre-school through third grade levels. General content areas include functions and graphs, geometry, logical thinking, measurement, numbers and operations, problem solving, sets, and statistics and probability. (DT)

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Happy Math

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Happy Teacher

Happy Kids

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Publisher

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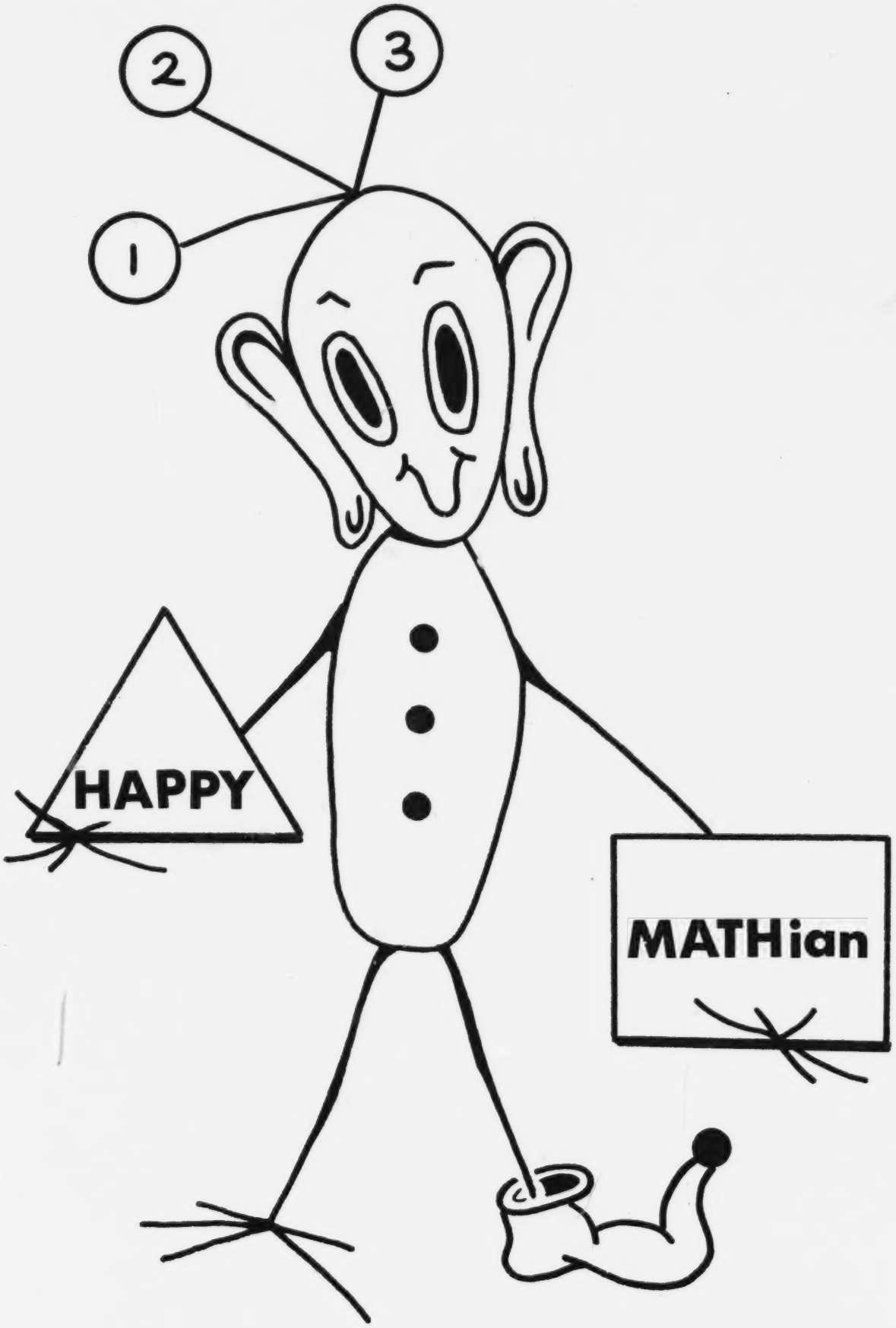
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HAPPY
MATHian

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INTRODUCTION

HAPPY MATH + happy teacher = happy kids

The games and activities presented in this book have all been selected because they teach and reinforce mathematical content in a "fun way". The ideas are suggested for use with preschool through third grade.

The material is listed in alphabetical order. This is for convenience only, as use of the games and activities have no sequential order. Any lesson may be given at any time to teach a concept or provide skill-building activities. An index has been provided for convenience in locating the activities according to math content.

Permission is hereby granted to reproduce only the student materials in this book for classroom use.

We encourage teachers to make any adaptations that will give them and their children "Happy Math" experiences.

We wish to give our thanks to all those teachers and authors who either taught us how to use these ideas with children, or taught the teachers who taught us.

THE AUTHORS

Elinor Chilcote received her B.A. degree from California State University, Northridge and is currently an elementary mathematics specialist with the Los Angeles Unified School District. She conducts workshops at the local and national levels for both teachers and parents, and serves as consultant for other school districts.

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Special Acknowledgment

To Michael Beckner, age 8, Studio City, California, for the Little Mathian.

Table of Contents

	Page
Arrow Codes	1
Banker's Choice	8
Blast Off ! ! !	10
Club Members	13
Coordinate Pictures	16
Common Difference	24
Count Down	26
Counting Fun	27
Count Up High	29
Difference Skills	31
Experiment With ABC's	33
Fifteen	34
Find My Home	35
Find the Numbers	38
Five in a Row	42
Flip	44
Forwards and Backwards	46
Freddy, the Kangaroo	48
Fun With >, <, =	53
Geometry Cards	55
Go !	72
Grab Bag Graphing	78
Guesstimation	81
I Have an Area, Copy Me	83
It Makes Cents	91
Math Waffles	92
Measure of the Day	94
Mini Hex	95
Moving Squares	98
Mr. Machine	99
My Line Designs	101
My Number Book	107
My Secret Number	116
Nomograph Families	117
Number Relay	119
Order of Symmetry	120
Paper Cup Toss	122
Park the Cars	124
Penny Toss	127
Picture Shapes	128
Picture Stories	132
Rescue the Princess	134
Roman Addition	137
Roman Mod 12	138
Scamper	141
See Saw Activities	142
Shape Clues	144
Six High	145

Table of Contents
(Cont'd)

	Page
Tangrams	147
Three in a Row, Addo	157
Tool Kit Activity	159
Tree House	162
What Am I ?	165
What's My Measure ?	174
Where's My Cage ?	176
Where Should My Numbers Go ?	181
Word Searching	185

GENERAL CONTENT AREAS

	Page
FUNCTIONS AND GRAPHS	
Coordinate Pictures	16
Experiment with ABC 's	33
Find My Home	35
Five in a Row	42
Flip	44
Grab Bag Graphing	78
Mr. Machine	99
Picture Stories	132
GEOMETRY	
Coordinate Pictures	16
Find My Home	35
Five in a Row	42
Flip	44
Freddy the Kangaroo	48
Geometry Cards	55
Grab Bag Graphing	78
Moving Squares	98
Mr. Machine	99
My Line Designs	101
Order of Symmetry	120
Picture Shapes	128
Shape Clues	144
Tangrams	147
LOGICAL THINKING	
Club Members	13
Count Down	26
Counting Fun	27
Experiment with ABC 's	33
Fifteen	34
Fun With $>, <, =$	53
Go	72
Grab Bag Graphing	78
Math Waffles	92
Mini-Hex	95
My Secret Number	116
Picture Shapes	128
Six High	145
Where's My Cage?	176

GENERAL CONTENT AREAS

MEASUREMENT

	Page
I Have an Area -- Copy Me	83
It Makes Cents	91
Measure of the Day	94
My Number Book (School Times)	113--115
See-Saw Activities	142
Tool Kit Activity	159
What's My Measure	174

NUMBERS AND OPERATIONS

Arrow Codes	1
Banker's Choice	8
Blast Off	10
Common Difference	24
Count Down	26
Counting Fun	27
Count Up High	29
Difference Skills	31
Fifteen	34
Find the Numbers	38
Flip	44
Forwards and Backwards	46
Freddy the Kangaroo	48
Fun With >, <, =	53
Go	72
Guestimation	81
It Makes Cents	91
Math Waffles	92
My Line Designs	101
My Number Book	107
My Secret Number	116
Nomograph Families	117
Number Relay	119
Paper Cup Toss	122
Park the Cars	124
Picture Stories	132
Rescue the Princess	134
Roman Addition	137
Roman Mod 12	138
Scamper	141
Six High	145
Three in a Row Addo	157
Tree House	162
What Am I?	165
Where Should My Numbers Go?	181
Word Searching	185

GENERAL CONTENT AREAS

	Page
PROBLEM SOLVING	
Arrow Codes	1
Experiment with ABC 's	33
Grab Bag Graphing	78
Math Waffles	92
Penny Toss	127
Where Should my Numbers Go?	181
SETS	
Club Members	13
Coordinate Pictures	16
Find My Home	35
Five in a Row	42
Flip	44
Geometry Cards	55
Card Guessing	56
Fast Draw	57
Filling Wholes	58
Follow the Leader	59
Geometry Relay	60
High Toss	61
Take One	62
Grab Bag Graphing	78
Mr. Machine	99
STATISTICS AND PROBABILITY	
Experiment with ABC 's	33
Grab Bag Graphing	78
Paper Cup Toss	122
Penny Toss	127
Picture Stories	132

Index

Addition	Page
Flip	44
Forwards and Backwards	46
Freddy, the Kangaroo	48
Go	72
It Makes Cents	91
Nomograph Families	117
Number Relay	119
Paper Cup Toss	122
Roman Addition	137
Six High	145
Three in a Row Addo	157
Tree House	162

Area	
finding,	
I Have an Area, Copy Me	83

Counting	
Blast Off !	10
Count Down	26
Count Up High	29
Counting Fun	27
Fifteen	34
Guesstimation	81
Math Waffles	92
Rescue the Princess	134

Counting (Cont'd)	Page
Roman Mod 12	138
What Am I ?	165

Data	
collecting and organizing,	
Experiment with ABC's	33
Grab Bag Graphing	78
My Number Book	107
Penny Toss	127
Picture Stories	132

Estimating	
linear measure,	
Measure of the Day	94
Tool Kit Activity	159
quantity,	
Guesstimation	81
weight,	
See Saw Activities	142

Functions	
Mr. Machine	99

	Page
Graphs	
bar,	
Experimenting with ABC's	33
Grab Bag Graphing	78
Picture Stories	132
Height	
My Number Book	107
Inequalities	
Fun With >, <, =	53
My Secret Number	116
Infinity	
Order of Symmetry	120
Lattices	
Arrow Codes	1
Matching	
shapes,	
Geometry Cards	55
Grab Bag Graphing	78
Picture Shapes	128
Where's My Cage	176
Measure	
non standard units,	
What's My Measure	174
Money	
It Makes Cents	91
Multiplication	
Math Waffles	92
Numbers	
counting,	
Blast Off !	10
Count Down	26
Counting Fun	27
Count Up High	29
Fifteen	34
Guesstimation	81
Math Waffles	92
Rescue the Princess	134
Roman Mod 12	138
What Am I ?	165
finite,	
Roman Mod 12	138
line,	
Freddy the Kangaroo	48
matching	
My Line Design	101
Park the Cars	124
negative	
Freddy the Kangaroo	48

	Page
Numbers (cont'd)	
patterns,	
Club Members	13
Count Down	26
Counting Fun	27
Math Waffles	92
Nomograph Families	117
Number Relay	119
place value,	
Banker's Choice	8
Count Up High	29
Six High	145
Where Should My Numbers Go ?	181
reading, number words,	
Word Searching	185
recognition and identification	
Find the Numbers	38
Scamper	141
regrouping,	
Banker's Choice	8
It Makes Cents	91
Number Relay	119
related to real world,	
My Number Book	107

	Page
Numbers (cont'd)	
relationships,	
Counting Fun	27
Fun With >, <, =	53
My Secret Number	116
Nomograph Families	117
Ordered Pairs	
Coordinate Pictures	16
Find My Home	35
Five in a Row	42
Flip	44
Palendromes	47
Predictions	
Experiment With ABC 's	33
Paper Cup Toss	122
Penny Toss	127
Roman Numerals	
Roman Addition	137
Roman Mod 12	138
Sets	
Club Members	13
Coordinate Pictures	16
Find My Home	35
Five in a Row	42

	Page
Sets (cont'd)	
Flip	44
Geometry Cards	55
Grab Bag Graphing	78
Mr. Machine	99
Shape	
recognition,	
Club Members	13
Geometry Cards	55
Grab Bag Graphing	78
relationship,	
Tangrams	147
component parts,	
Geometry Cards	55
Shape Clues	144
symmetry,	
Order of Symmetry	120
arrangement,	
Grab Bag Graphing	78
Moving Squares	98
Subtraction	
Common Difference	24
Difference Skills	31
Freddy, the Kangaroo	48

	Page
Subtraction (cont'd)	
Go I	72
Nomograph Families	117
Number Relay	119
Substitution	
rule for,	
Where's My Cage	176
Strategy	
Fifteen	34
Mini Hex	95

Arrow Codes

Use page 3 for children to find the secret message.

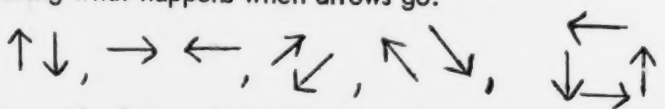
Name a beginning letter and indicate by arrows which direction to go to find each secret letter of the message.

For example: Given N ↓, the letter immediately below the letter N is an S. Continue this procedure to complete the secret word.

N ↓	leads to the letter	S
I ↙	leads to the letter	M
F → → →	leads to the letter	I
C ↓ ↓ ←	leads to the letter	L
D →	leads to the letter	E

For additional secret messages use pages 4 - 7.

Messages may be made simple or complex according to the level of the children's ability. Let children have fun discovering what happens when arrows go:



Note: The letter Z which is not often used, has been omitted in order to make an even 5 x 5 grid.

Variation: Children develop their own secret messages for their classmates.

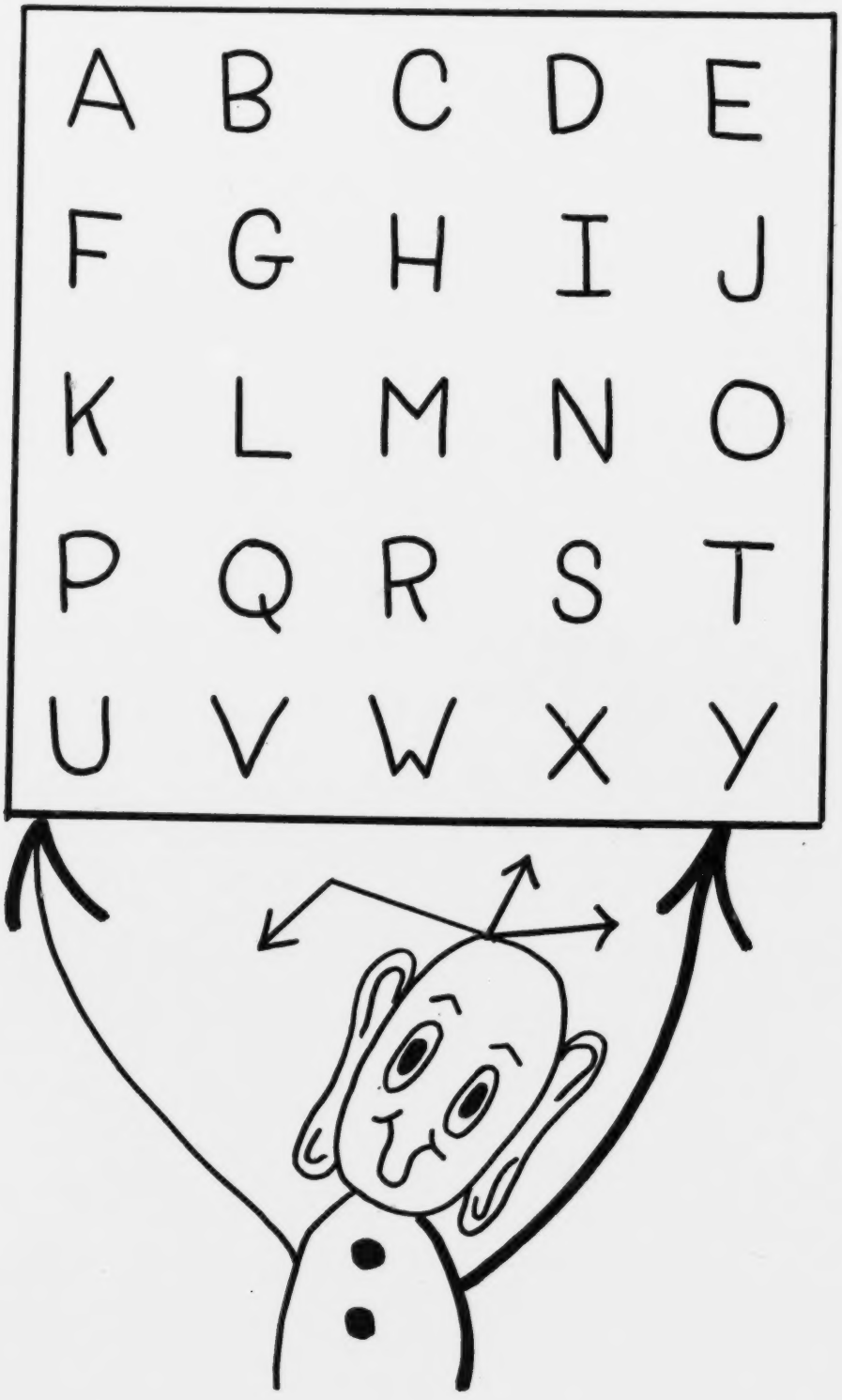
Objectives:

To interpret flow direction

To introduce vectors

Solutions to Secret Messages

Page 4	Happy Math
Page 5	Good Work
Page 6	You Have Won
Page 7	Make One of Your Own


A B C D E
F G H I J
K L M N O
P Q R S T
U V W X Y

Secret Message

B ↓ → _____

F ↑ _____

R ← ← _____

V ↖ _____

O ↓ ↓ _____

D ↓ ↓ ← _____

G ← ↑ _____

S → _____

L → ↑ _____

Secret Message

B ↓ _____

N → _____

T ↑ _____

N ↑↑ _____

Y ← ← _____

M → → _____

V ↗ _____

G ↙ _____

Secret Message

Y↑↓ _____

S↗ _____

P↓← _____

G↗↓ _____

A↓↑← _____

Q↓ _____

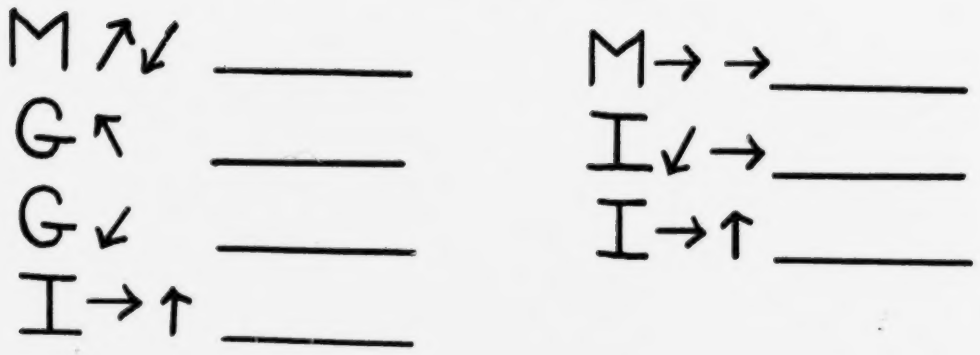
C↓↗ _____

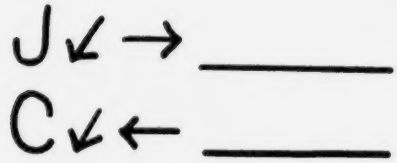
Q↓ _____

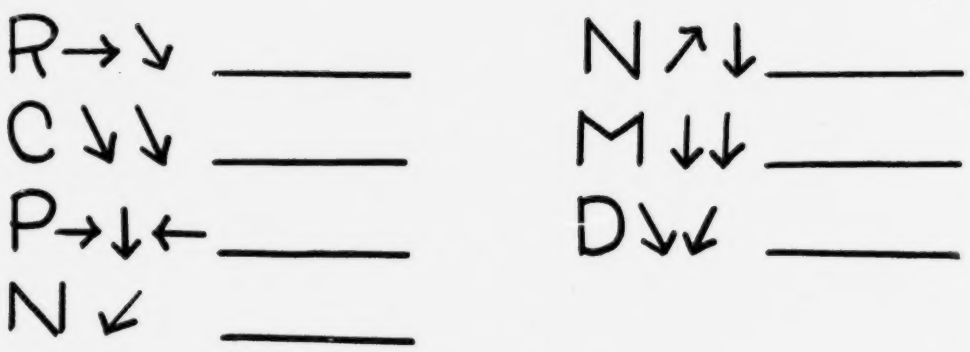
R↑→ _____

B↓↓ _____

Secret Message







Banker's Choice

Provide groups of children with objects that represent ones, tens, and one one hundred. These can be in the form of:

a) construction paper squares, rectangles that will exactly fit ten of the squares, and one large square that ten rectangles will fit, or

b) plastic chips of different colors

c) any rods, squares and cubes

Give each group of players a pair of dice. One player is the banker and the other players take turns tossing the dice and going to the bank to get the number of objects that are shown on their dice.

Whenever a player collects ten ones, he must exchange them at the bank for one ten.

As soon as a player obtains ten tens, he exchanges them for the one hundred.

Winner is the player who takes the one hundred first. He then becomes the banker for the next game.

Variations:

Play the game Trade 3.

Materials:

one die
red objects, blue objects, and green objects

Players take turns tossing the die and taking the number of red objects as shown on the die.

Players must trade 3 red objects for a blue, then 3 blues for a green object.

First player to get a green object is the winner. Winner is the banker for the next game and chooses the number of objects to be traded for each next color (4, 5, 6, etc.)

Above games can be played in reverse. Players begin game with a given object or numbers of objects that represent the square of the base chosen for that game. (If game is played in base 10, the green object represents 100; if game is played in base 3, the green object represents 9; if game is played in base 4, the green object represents 16, etc.)

Players take turns tossing die to determine how many ones they can deposit at the bank. Exchanges are made in the base decided for the game being played.

The first player to deposit all his ones is the winner and banker for the next game.

Objectives:

To understand place value

To build regrouping skills

Blast Off !!!

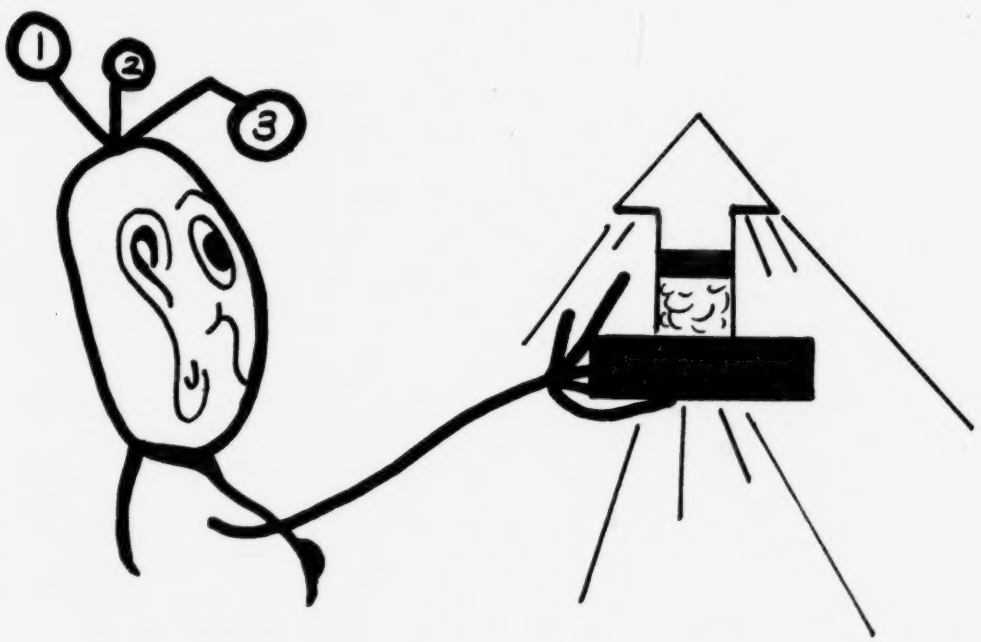
Use page 11 for the game board. Color if desired.

Use page 12 to make spinner, use beans for markers.

Players take turns spinning for a number and move that many spaces.

Children follow directions when they land on them.

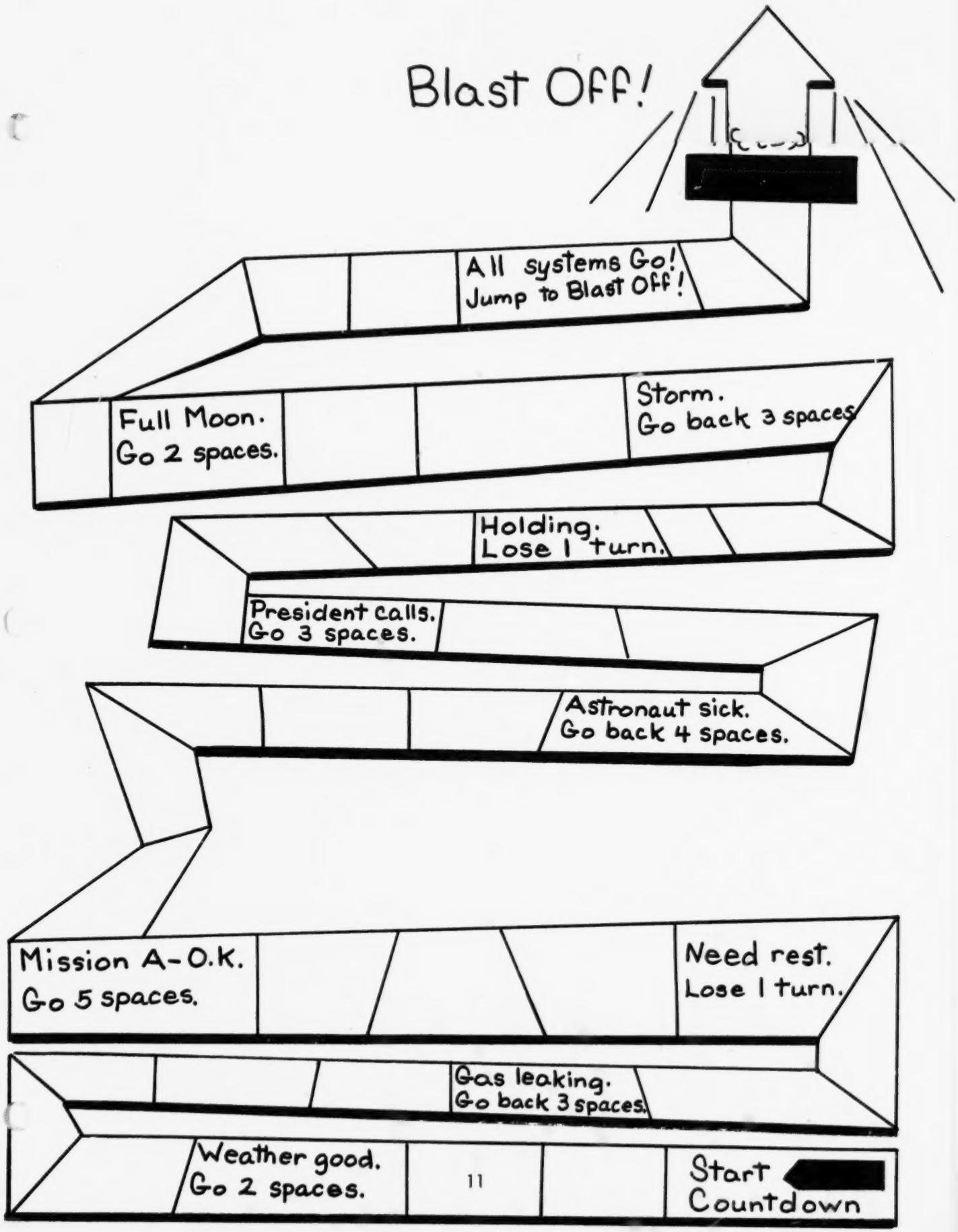
Winner is the first player to blast off.

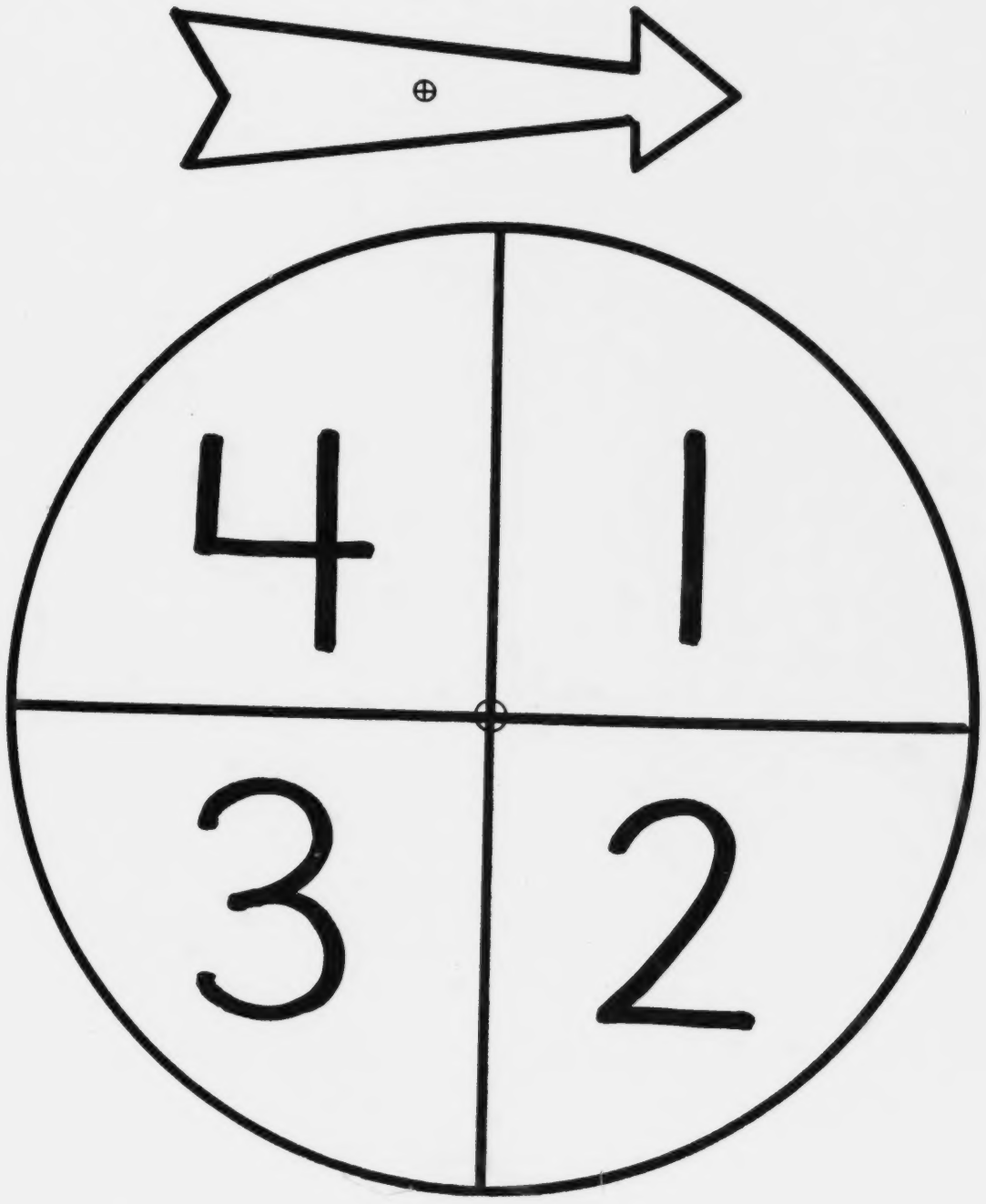


Objectives:

To understand the counting order of numbers

To follow directions


Blast Off!
All systems Go!
Jump to Blast Off!
Full Moon.
Go 2 spaces.
Storm.
Go back 3 spaces.
Holding.
Lose 1 turn.
President calls.
Go 3 spaces.
Astronaut sick.
Go back 4 spaces.
Mission A-O.K.
Go 5 spaces.
Need rest.
Lose 1 turn.
Gas leaking.
Go back 3 spaces.
Weather good.
Go 2 spaces.
Start
Countdown


4
1
3
2

Club Members

Experiences in hunting for patterns.

Display a row of shapes, figures or numbers that have common attributes. Underneath, display some that have none of the attributes common to the first group. In the third row display a mixture of those that have the common attribute and those that do not. Ask the children to choose which belong to the first group.

Examples:

These are members of the club.

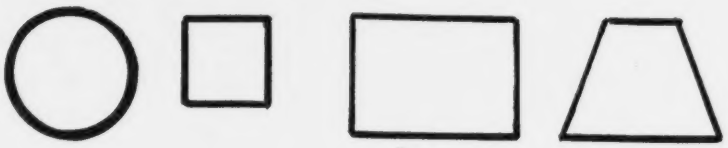
These are not members.

Which of these are members?

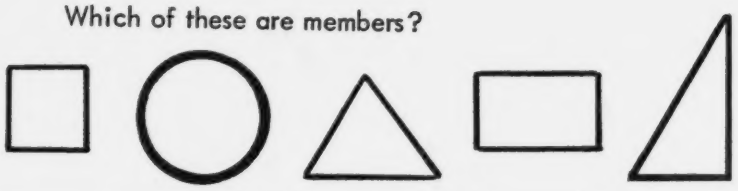
Note: Members are all open shapes.

These are members of the club.

These are not members.



Which of these are members?



Note: Members are all triangles.

These are members.

10, 250, 50, 1,000

These are not members.

5, 27, 249, 17

Which of these are members?

6, 20, 40, 3,976

Note: Members all end with zero.

Other suggested attributes:

Shapes with all straight sides

Shapes with curved sides

Shapes with one line inside

Shapes with one point inside

Shapes with a tail

Letters of the alphabet made from only straight lines

Numbers made from only one straight line

Numbers made from only curved lines

Numbers that count by 3's or 4's etc.

Variation:

Put display on a ditto sheet for individual activity.

Objectives:

To recognize patterns

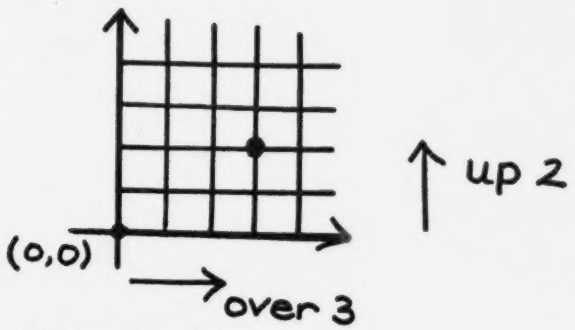
To see relationships

Coordinate Pictures

Use pages 18 to 23.

Children make dots from the ordered pairs. The first number of the ordered pair tells how many lines to count over and the second number tells how many lines to count up. Always start counting in the lower left hand corner. This is ordered pair (0,0).

Example for the ordered pair (3,2)



Dots are listed in columns.

1	4	7
2	5	8
3	6	etc.

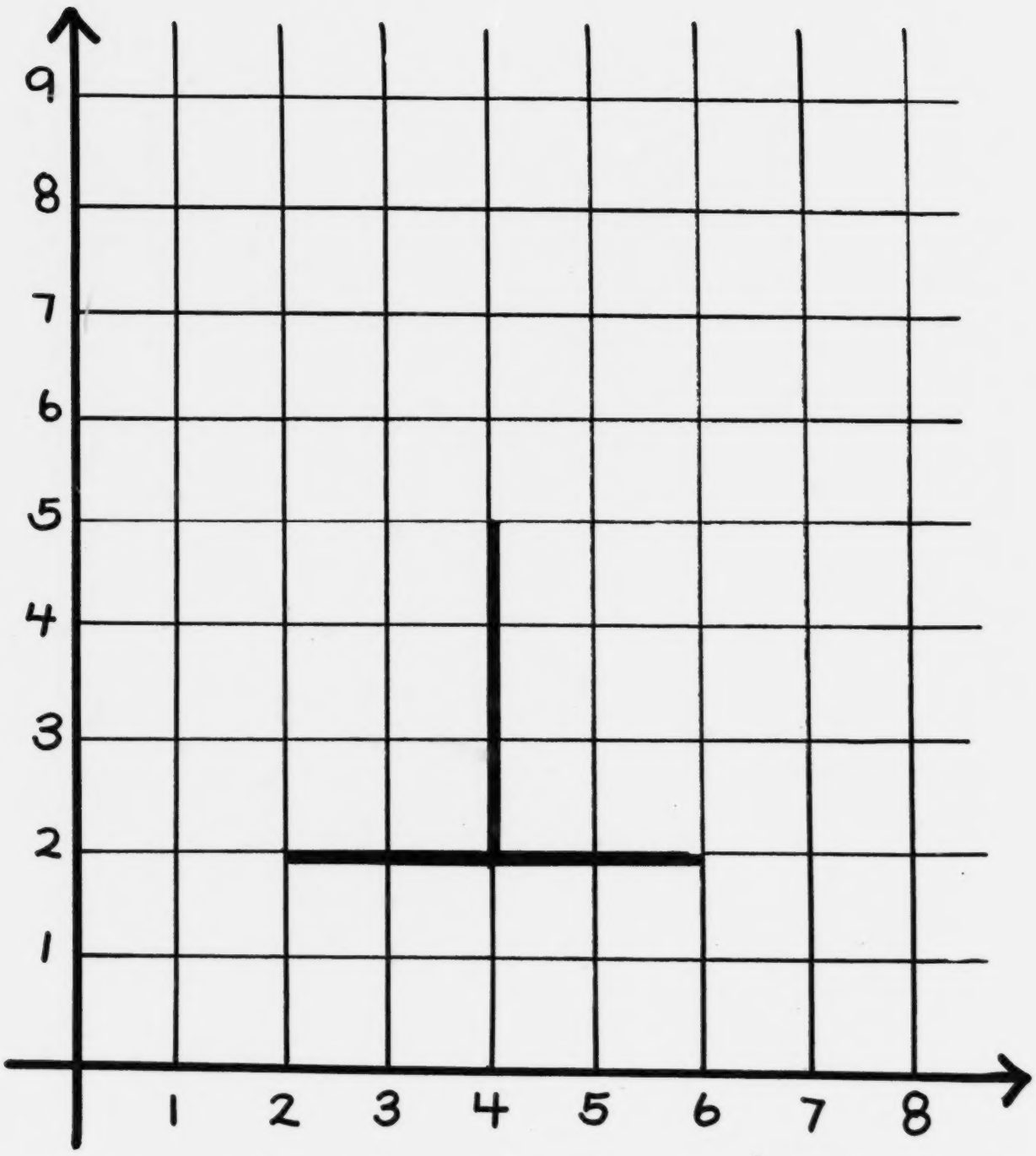
Make the dots in the above order, connect them as they are made, and make a picture.

Objective:

To gain skill in plotting coordinate points

Answers to Coordinate Pictures

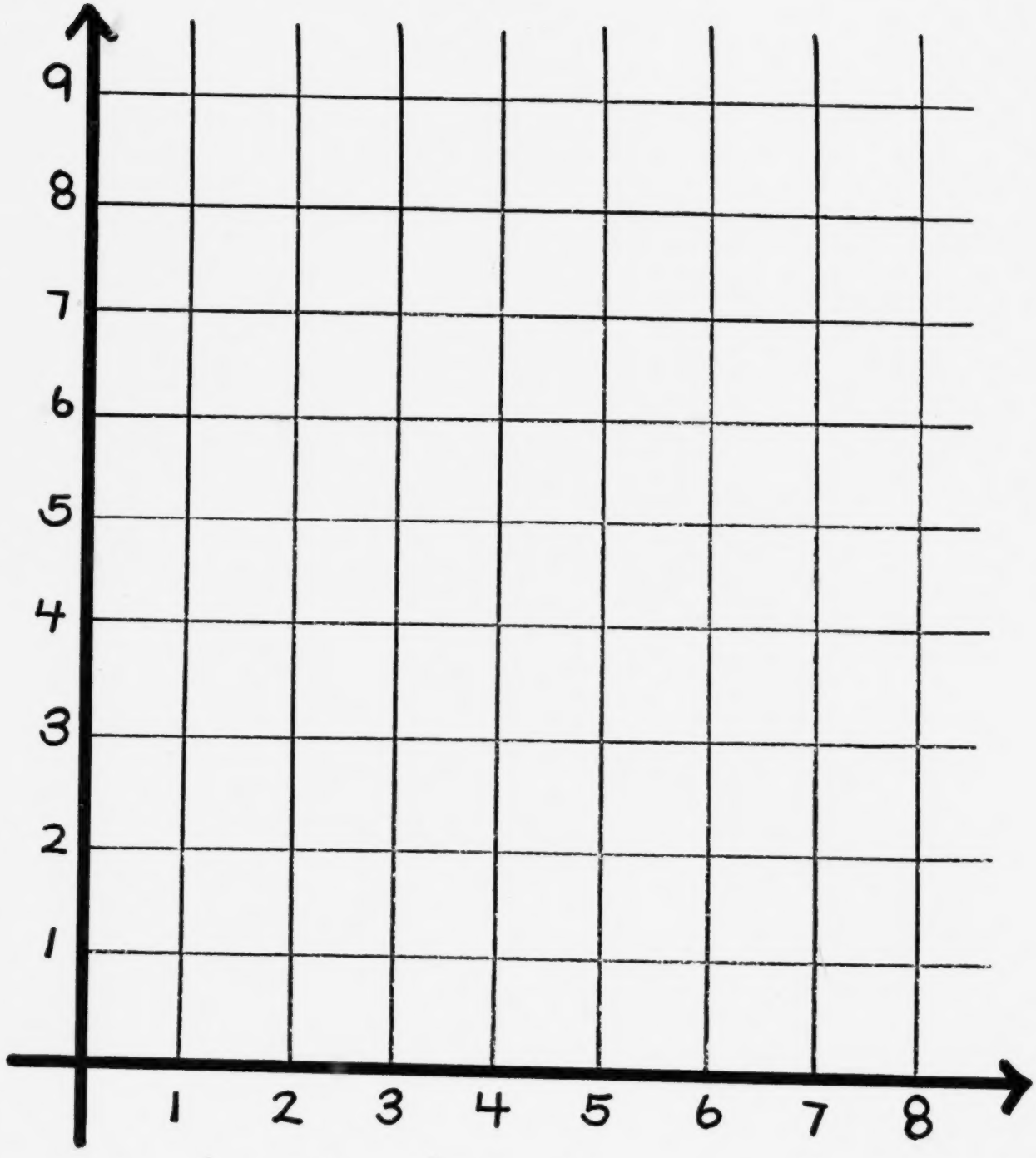
Page 18	Sailboat
Page 19	Star
Page 20	House
Page 21	Tree
Page 22	Turtle
Page 23	Ship



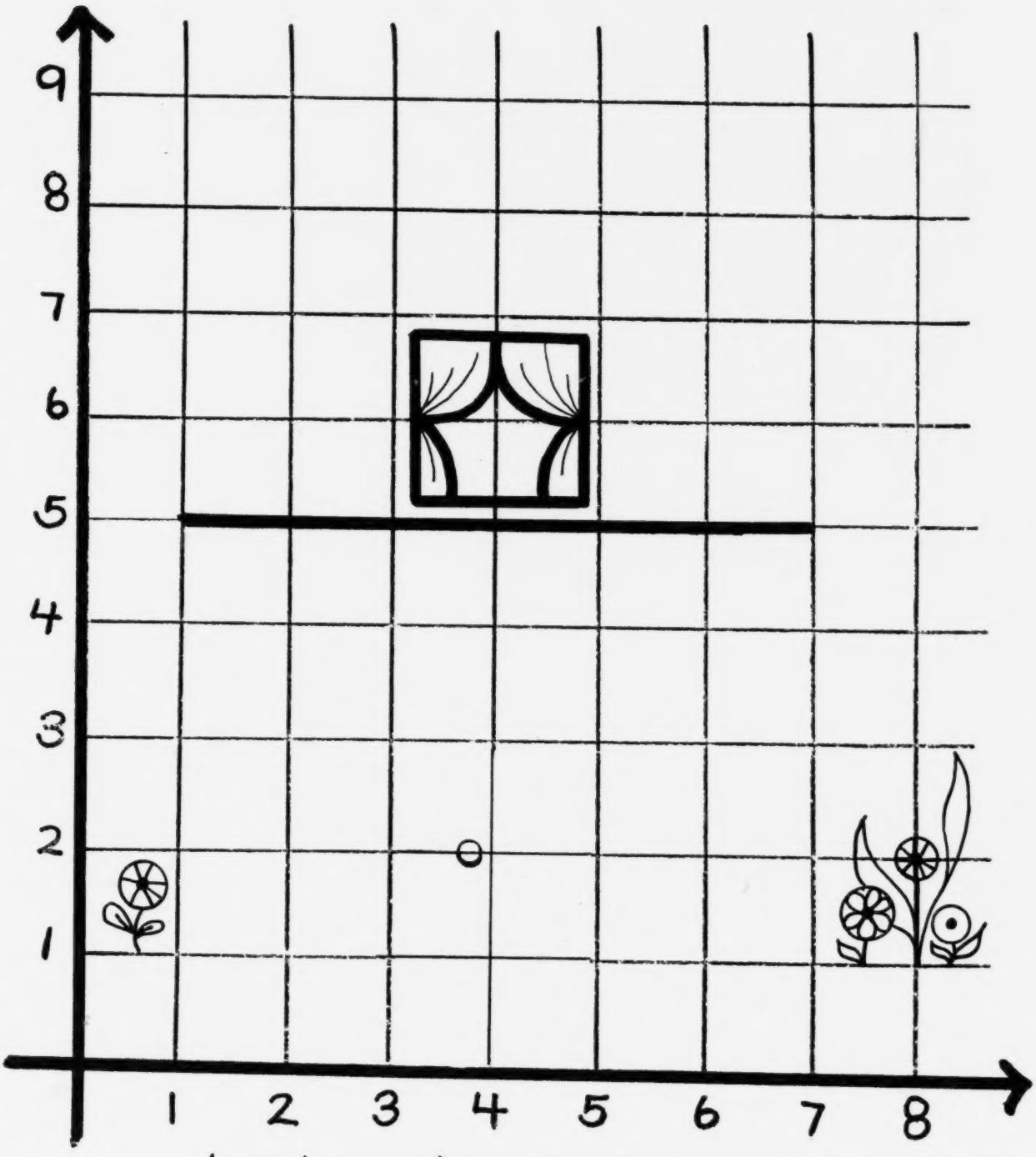
(2,2) (5,1) (4,5)

(3,1) (6,2) (4,6)

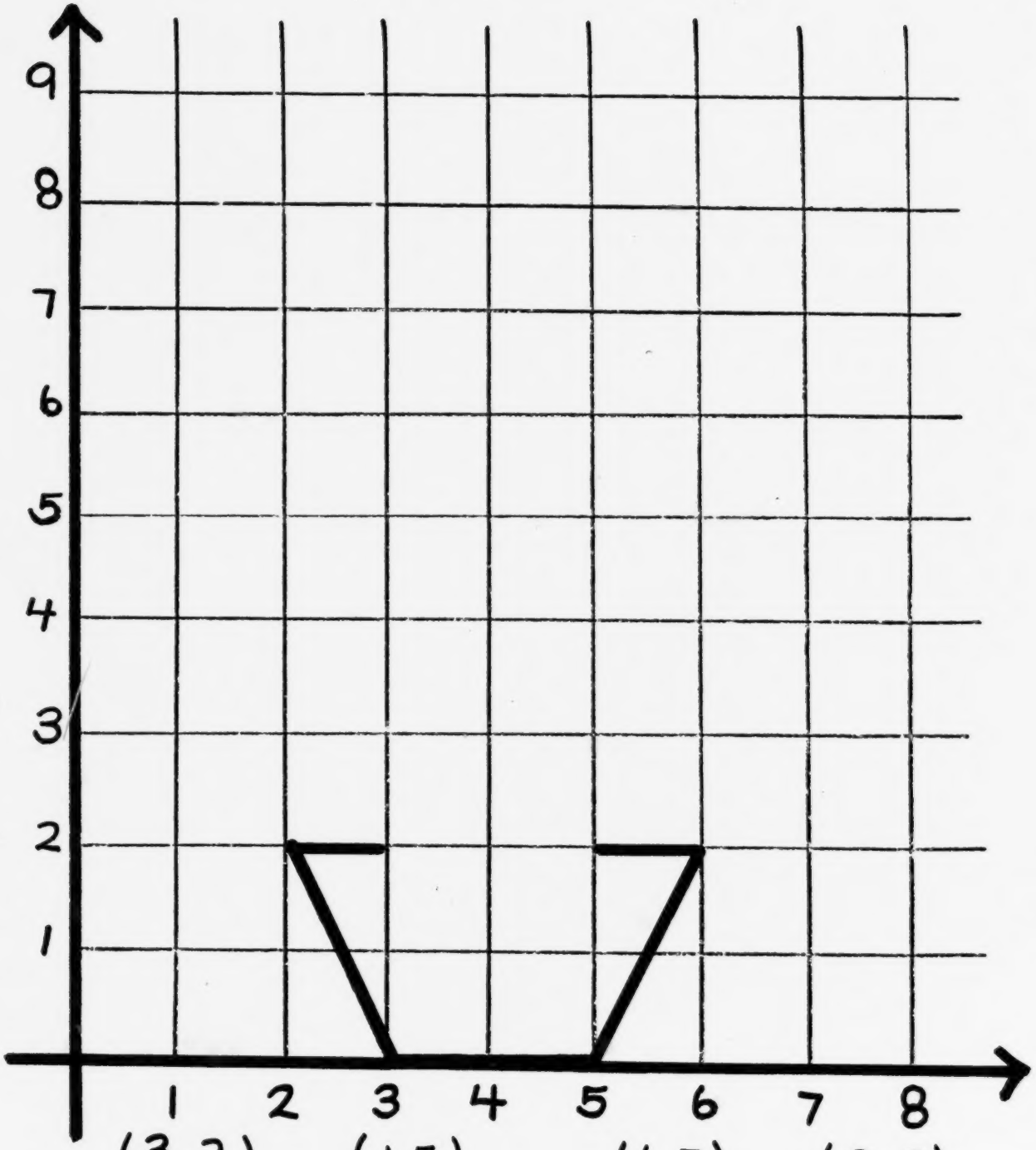
(2,2)



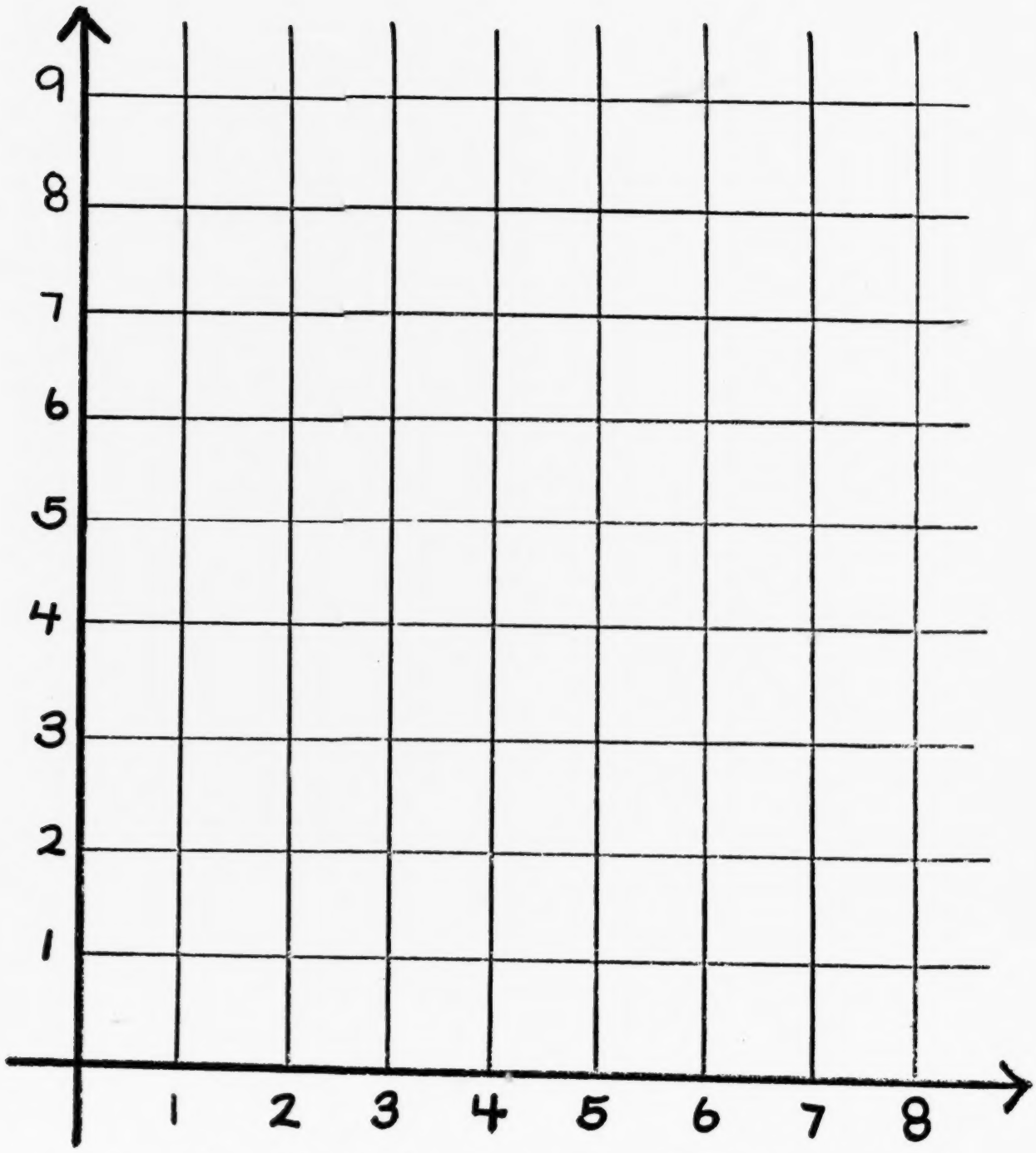
(1,4) (4,2) (7,4) (3,4)
(3,3) (6,0) (5,4) (1,4)
(2,0) (5,3) (4,7)



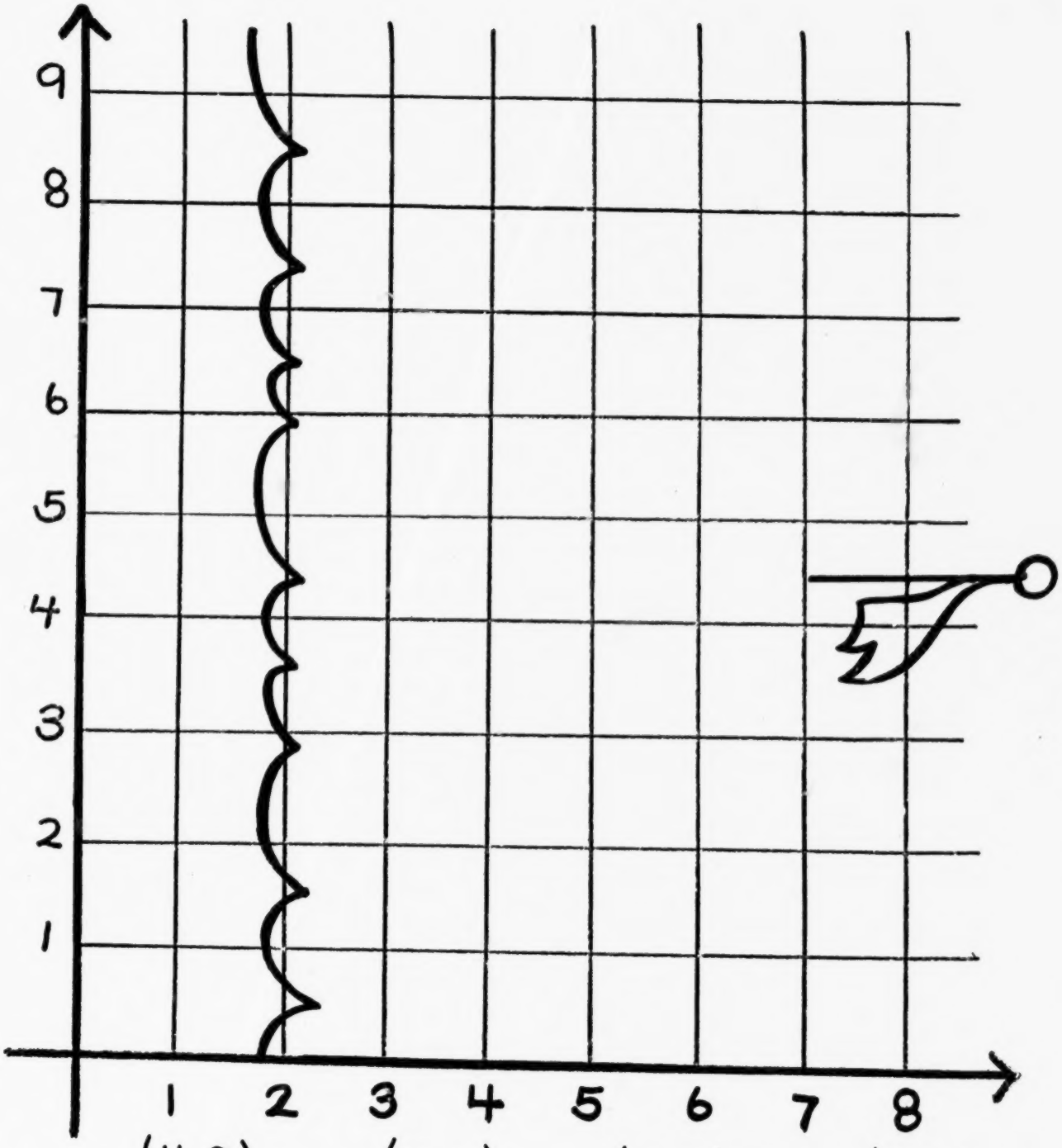
(1, 1)	(5, 7)	(7, 5)	(4, 3)
(1, 5)	(5, 8)	(7, 1)	(4, 1)
(4, 8)	(6, 8)	(3, 1)	(1, 1)
(6, 6)	(6, 6)	(3, 3)	



(3, 2)	(1,5)	(6,7)	(8,3)
(3, 3)	(3,7)	(5,7)	(5,3)
(0,3)	(2,7)	(7,5)	(5,2)
(2,5)	(4,9)	(6,5)	(3,2)



(0,1)	(3,2)	(5,2)	(8,3)	(1,5)
(1,2)	(4,2)	(6,2)	(7,3)	(0,1)
(1,1)	(4,1)	(6,4)	(6,2)	
(2,1)	(6,1)	(8,4)	(4,5)	



(4,0)	(4,7)	(7,4)	(5,2)
(2,2)	(5,7)	(6,4)	(4,2)
(2,7)	(5,5)	(6,3)	(4,0)
(4,9)	(6,4)	(5,3)	

Common Difference

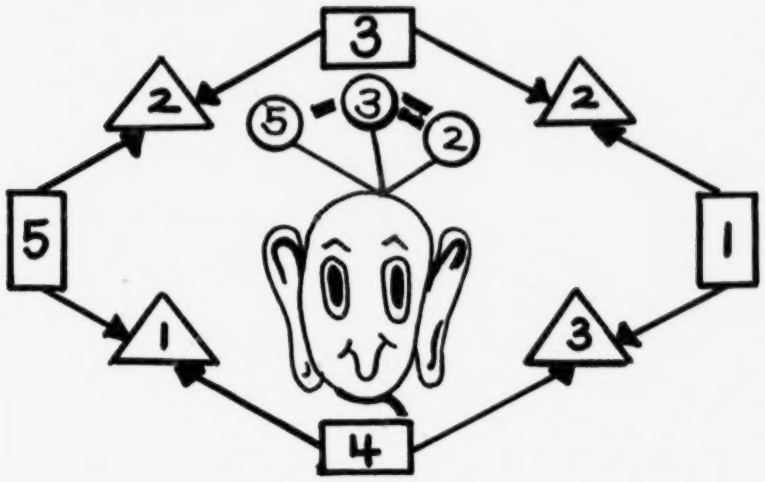
Use page 25.

Have children place a different number in each of the rectangles and find their differences. Explain that the difference is found by subtracting the smaller number from the larger one. Then have them follow the arrows and put the differences in the triangles. Continue putting differences in each succeeding shape indicated by arrows.

Stop when all differences contain the same number.

Continue pattern with different shapes if the differences are not common in the circles.

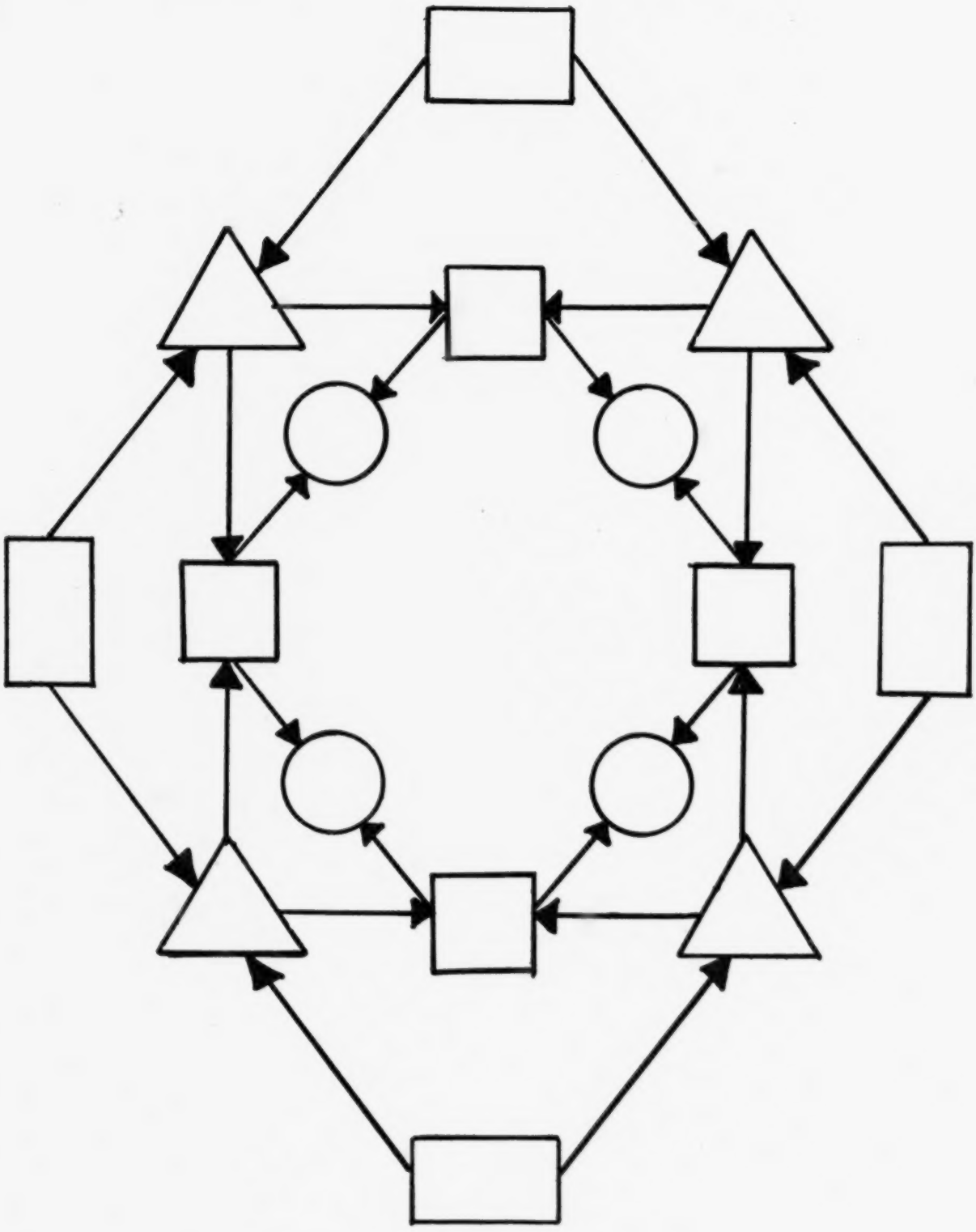
Encourage children to find a way they can always arrive at a common difference in the circles, or in the diamonds, one step more than the circles etc.



Objective:

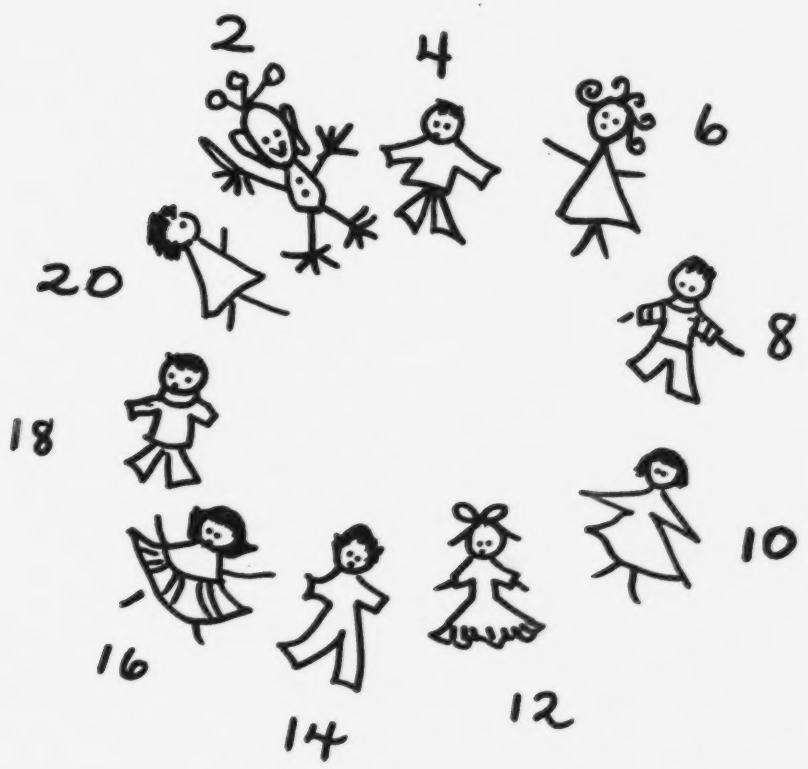
To reinforce subtraction facts

Common Difference
(use numbers 1-5)



Count Down

Children form a circle around the room. Game starts with children taking turns counting by two's up to 20 and continues with children counting by three's up to 30, then four's to 40 etc. If a child misses his count he sits down. Last child up is the winner.



Objectives:

To develop skills for multiplication

To find number patterns

Counting Fun

Name a number and have the class give the next higher number. Pace the speed and difficulty of the numbers according to the children's ability.

Vary the rule and ask children to name the next lower number, the number that is two more, five more, ten more, etc.

Counting Fun
(Cont'd)

Begin counting by two's, three's, four's, etc. and ask the children to join you when they have discovered your pattern. All the counting stops when you hold up your hand.

Some patterns to try are:

2, 5, 8, 11, 14, ...

4, 7, 10, 13, 16, ...

23, 28, 33, 38, ...

7, 17, 27, 37, ...

56, 54, 52, 50, ...

Objectives:

To understand the counting order of numbers

To build skills in finding patterns

Count Up High

Use Page 30.

Children work in small groups. Each group receives a pair of dice and each player receives a game page and two markers.

One marker is placed under the ones column and the other is placed under the tens column.

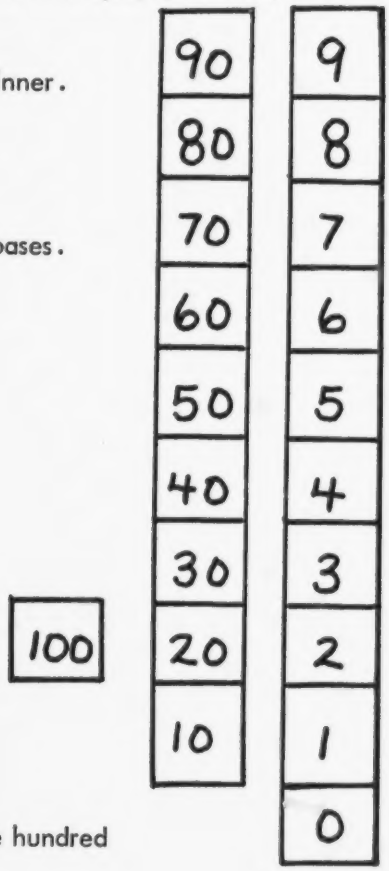
Players take turns tossing the dice, adding the numbers showing on the dice, and moving their marker up the ones column that many spaces.

When a player's toss takes him past the nine space, he then moves the tens marker.

Player who reaches 100 first is the winner.

Variation:

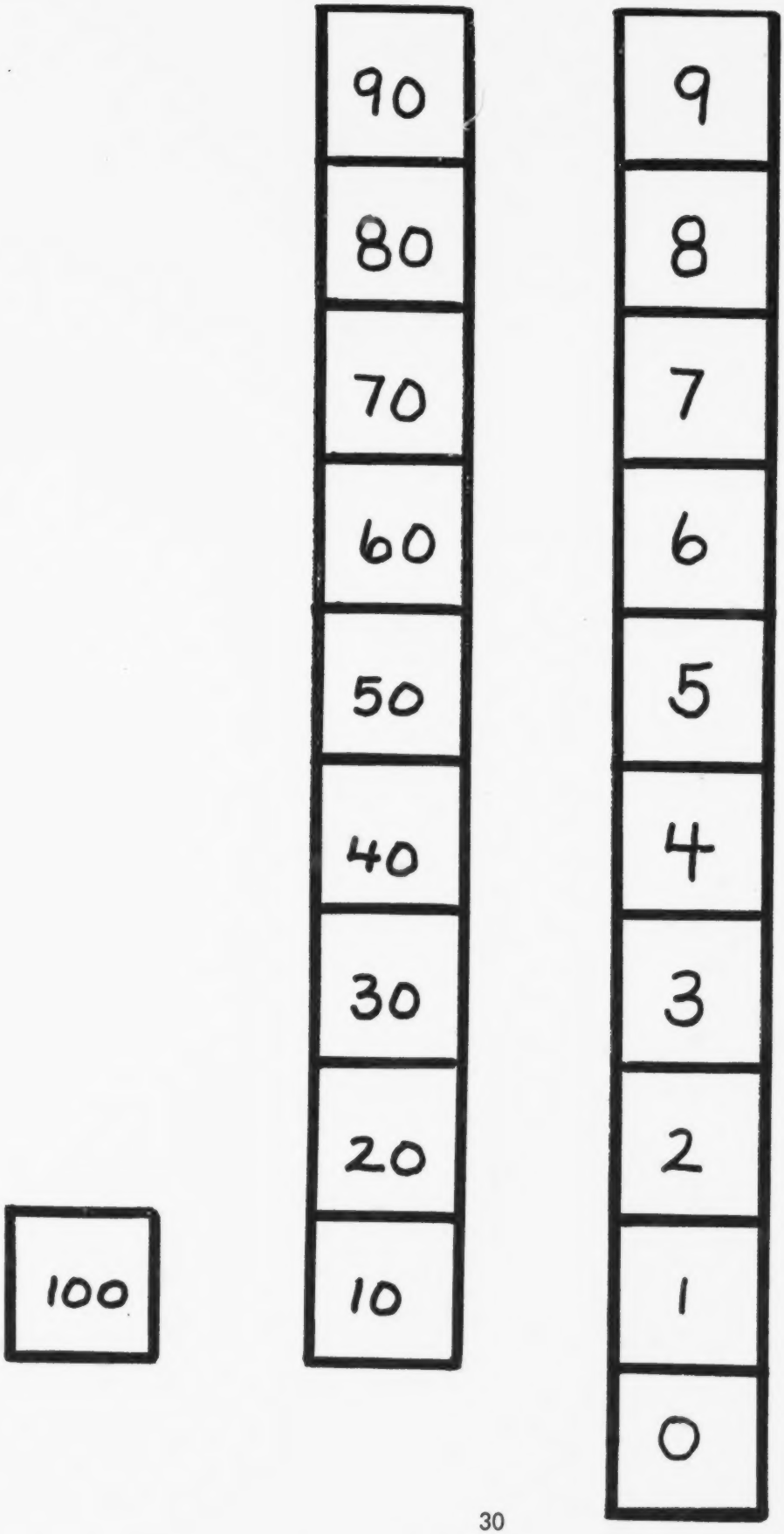
Play same games using other bases.



Objectives:

To understand place value

To build counting skills to one hundred


90
80
70
60
50
40
30
20
10
100
9
8
7
6
5
4
3
2
1
0

Difference Skills

Give children page 32.

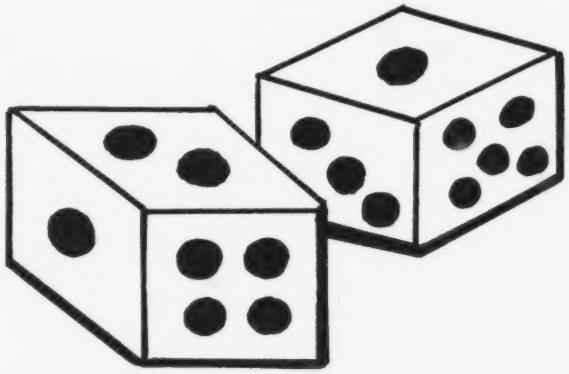
Teacher tosses two dice and tells children the numbers showing on each die. Children determine the difference. Tell them the difference is found by subtracting the smaller number from the larger one, or by counting how many numbers there are from one number to the other.

Repeat for ten tosses and have children record each <u>difference</u> on their score papers.

Give the answers orally and let the children check their work.

Variation:

Small groups of children take turns tossing the dice and recording their differnces. After five turns children add up their scores and lowest score wins.



Objective:

To reinforce subtraction facts

Score

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

_____

Total

Experiment with ABC 's

An activity for groups of 2 or 3 students.

Give them a very easy book and ask them to open to any page.

Let them keep a record of the number of times each letter of the alphabet appears.

(i.e. all the a's, e's, t's etc.)

Have them graph the results. (See "Picture Stories" page 132 for graphing directions.)

Compare the graphs from several groups. See if some letters appear more often than the others. Are there some letters that did not appear at all?

Make a prediction as to what the graph would look like on any page. Let a volunteer test the prediction.

Extended activity:

Do the same activity with a more advanced book.

Objectives:

To introduce probability and statistics

To build graphing skills

Fifteen

A game for two players.

Place 15 objects (such as beans, counters, disks etc.) between two players.

Players take turns removing only one, two, or three objects at a time.

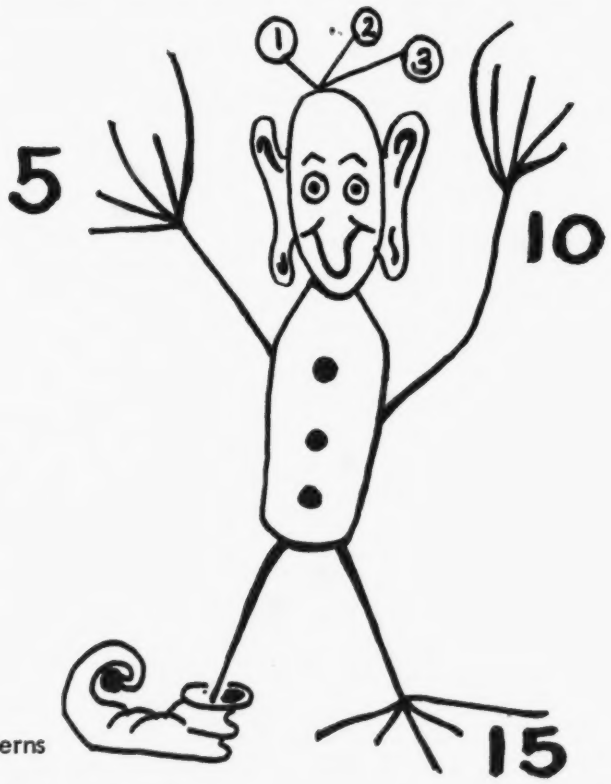
Winner is the player who makes his opponent take the last object.

Encourage children to find a pattern that they can use to make sure that they always win.

Variations:

For young children begin with five objects.

For older or more advanced children begin with 21 objects.



Objectives:

To find patterns

To develop skills of strategy

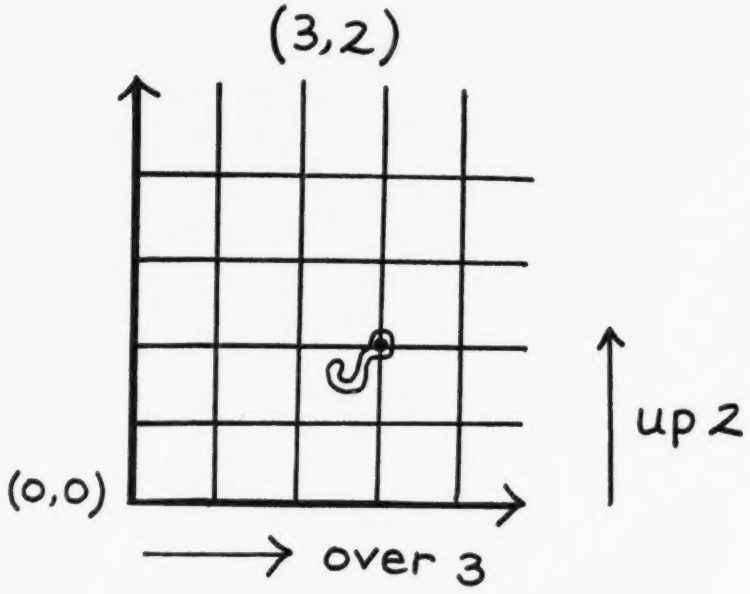
Find My Home

Use page 36.

Cut out animals and place on different points of the grid.

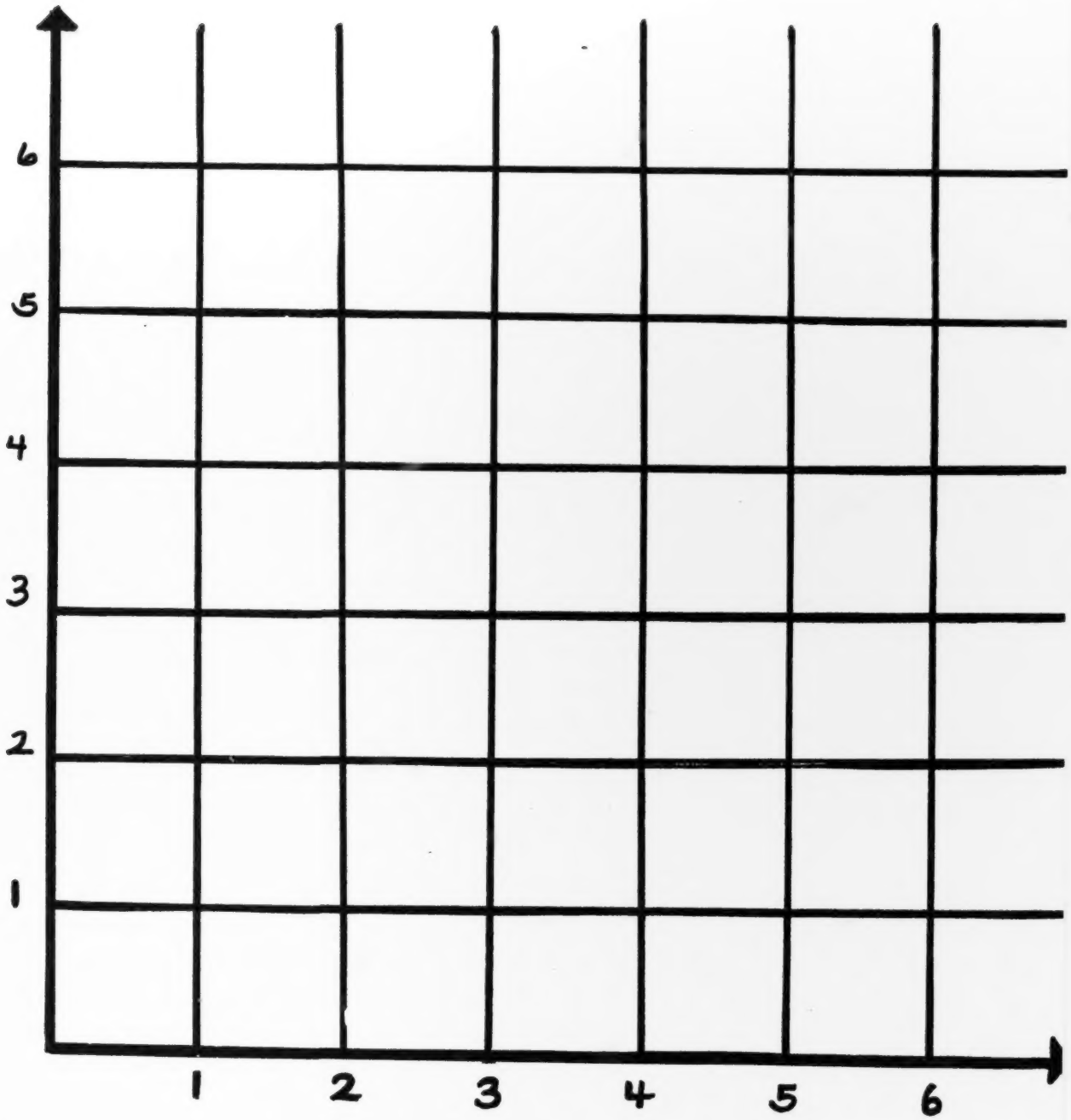
Display to small groups of children.

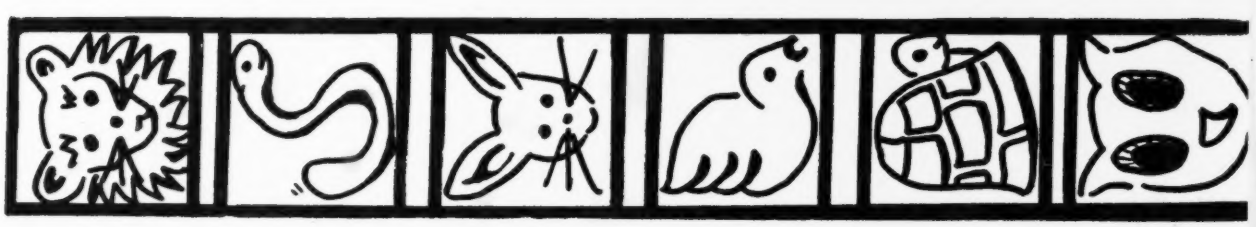
Give children page 37 and let them fill in the ordered pairs for each animal's home. (See page 16 for another lesson on ordered pairs.)



Objective:

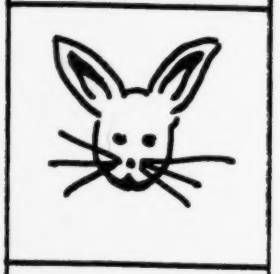
To build skill in naming ordered pairs


6
5
4
3
2
1
1
2
3
4
5
6



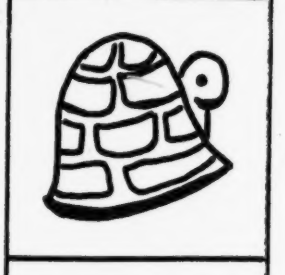
My home is at _____

My home is at _____



My home is at _____

My home is at _____



My home is at _____

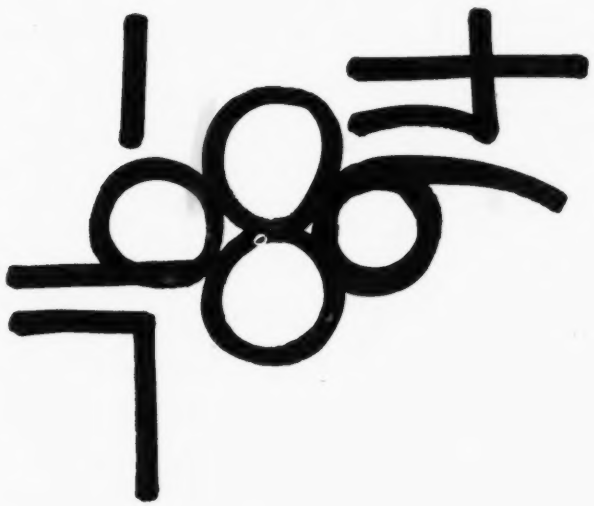
My home is at _____

Find the Numbers

Children love to search. Pages 39 to 41 provide opportunities for them to search for numbers.

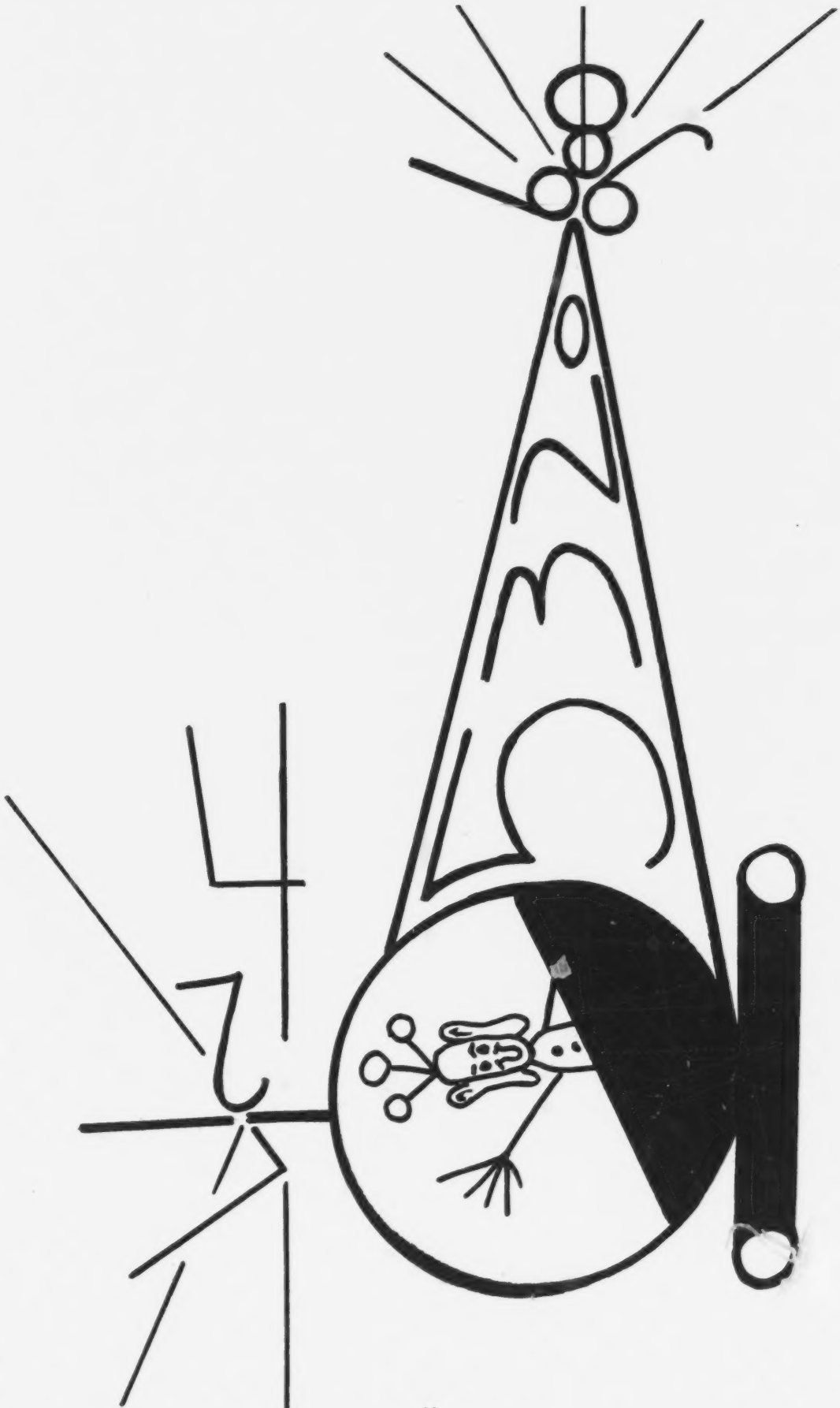
For children who are just learning to recognize numbers, use overhead projector and le children work in small groups.

Older children each receive their own copy and work independently.



Objective:

To recognize and identify numbers



Five in a Row

Tic Tac Toe

Use page 43.

Two players use the same page.

A game for two children.

Players determine who is going to make x's and who is going to make o's.

Players take turns tossing dice.

They read the two numbers on the dice as ordered pairs. (See page 16)

A player may use them in either order he chooses and places his mark on the grid.

Winner is first player to get five of his marks in a row.

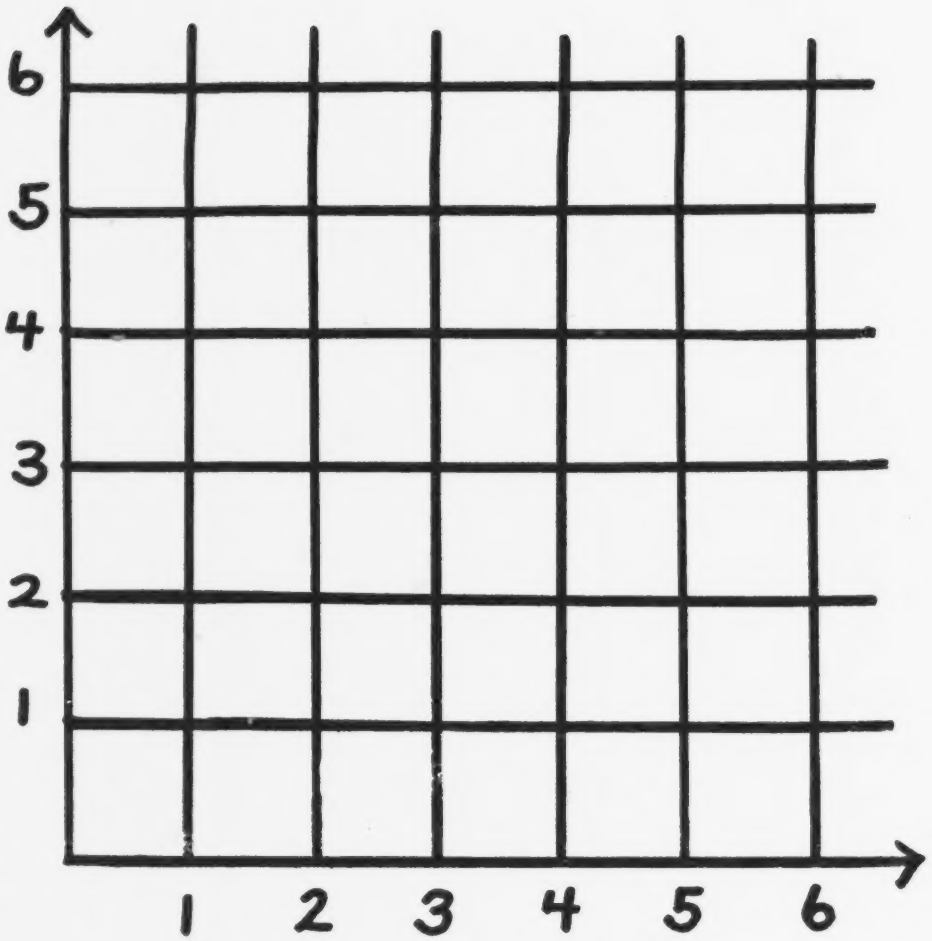
Variation:

This could be played with 2 teams and the grid on chalkboard or overhead projector.

Objective:

To build skills in plotting ordered pairs

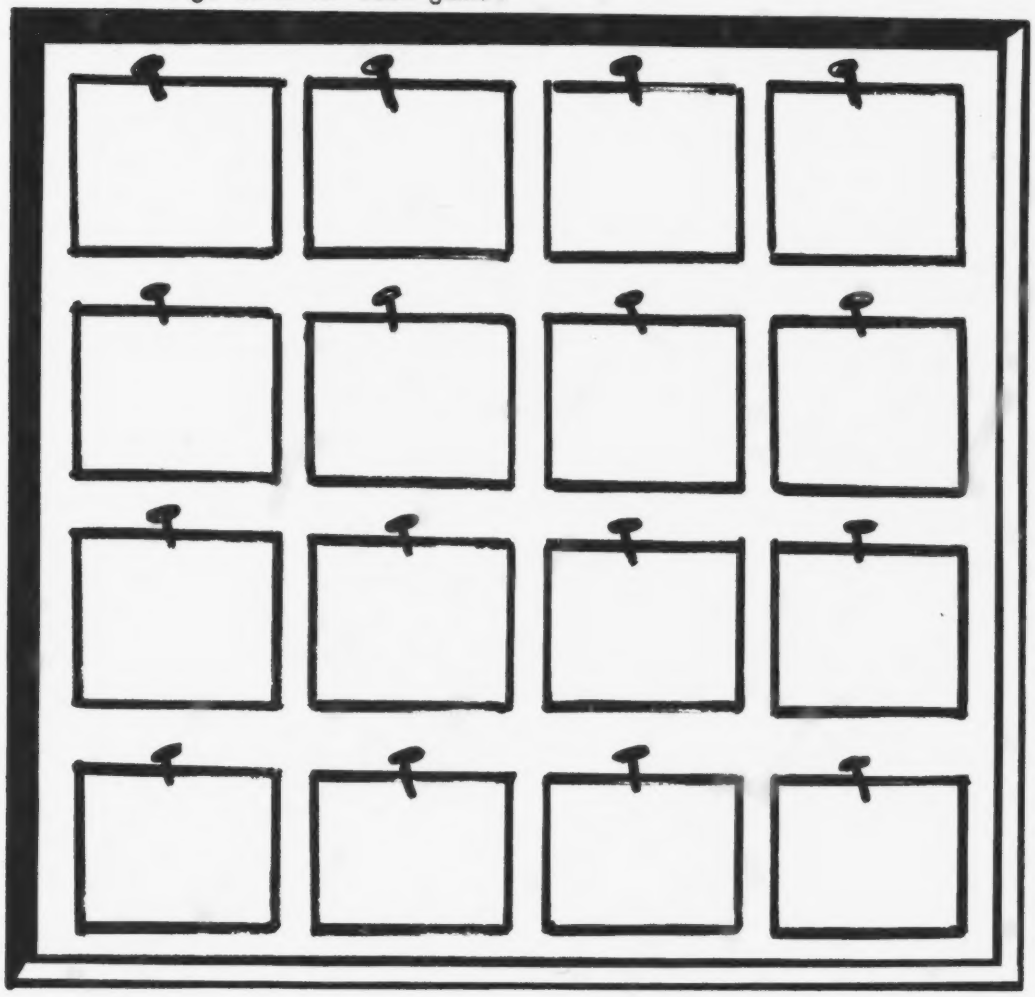
Five in a Row



Flip

Select two teams.

Display a board with removable cards arranged in an array. Mark numbers on cards and face numbers toward board. Re-arrange cards for each game.

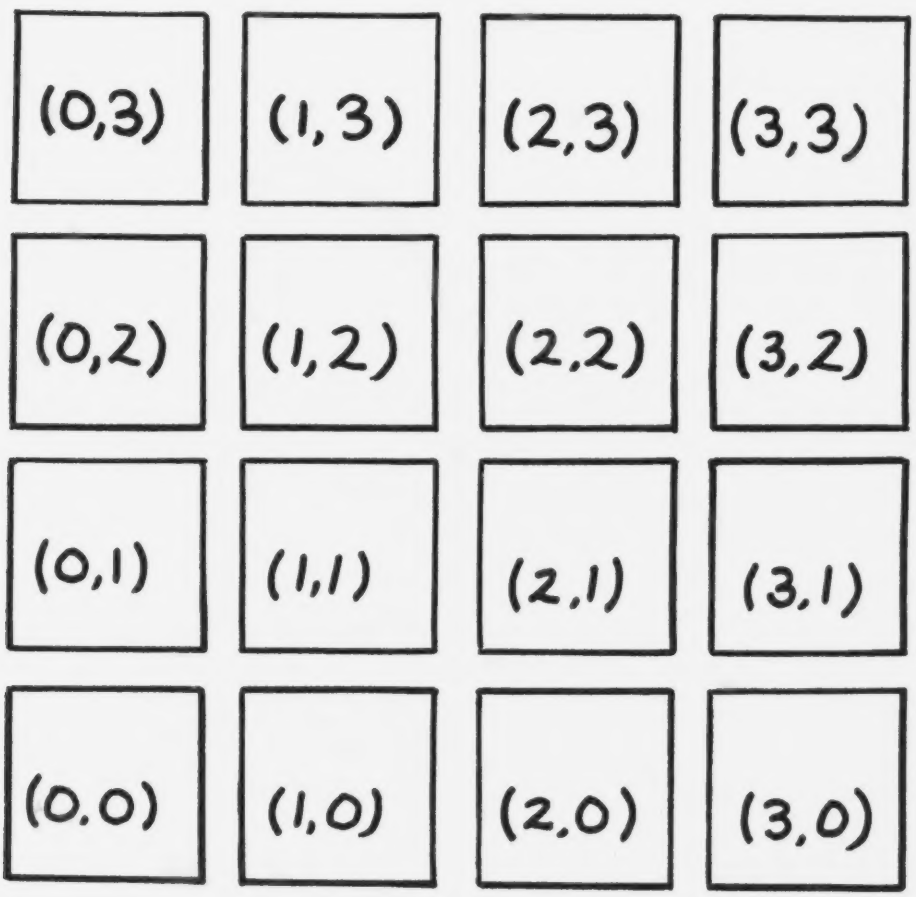


Children will take turns naming an ordered pair. (See page 16 for directions.) The card in lower left hand corner is (0,0).

That card is turned over and it is the score for that team.

Teams take turns and running scores are kept.

When all cards are turned over, the team with the highest score wins.



Objectives:

To reinforce addition facts

To build skills in naming ordered pairs

Forwards and Backwards

Ask the children to give some words that are spelled the same forwards and backwards. (mom, pop, dad, level, pep, pop, etc.)

Tell them they can make numbers that are the same forwards and backwards.

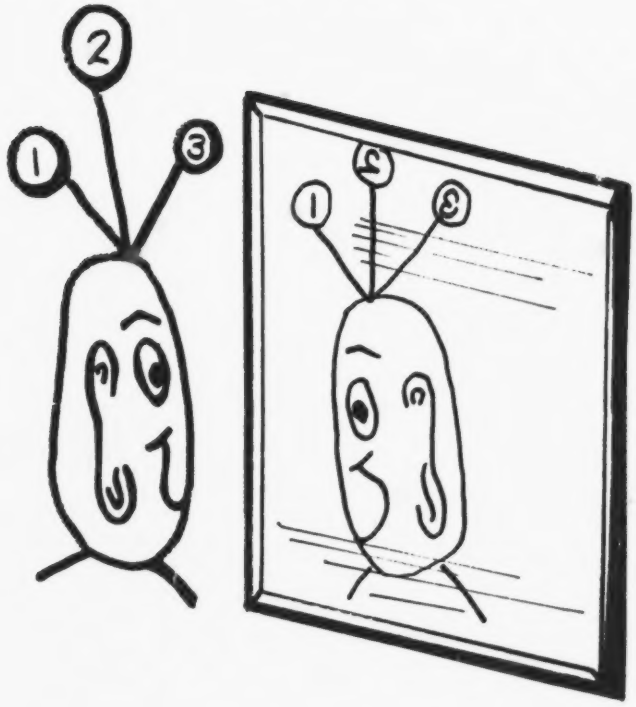
Put a 2 or more digit number on the board. Put its reverse under it and add. If the sum is not a number that reads the same forwards and backwards, then reverse the sum, place it underneath and add those two numbers.

Continue repeating this process until a sum appears that reads the same forwards and backwards.

For examples see next page.

$$\begin{array}{r} 10 \\ +01 \\ \hline 11 \end{array} \qquad \begin{array}{r} 31 \\ +13 \\ \hline 44 \end{array} \qquad \begin{array}{r} 244 \\ +442 \\ \hline 686 \end{array}$$

$$\begin{array}{r} 263 \\ +362 \\ \hline 625 \\ +526 \\ \hline 1151 \\ +1511 \\ \hline 2662 \end{array}$$



Note: For younger children use only numbers from 1 - 4.

Example:
$$\begin{array}{r} 23 \\ +32 \\ \hline \end{array} \qquad \begin{array}{r} 30 \\ +03 \\ \hline \end{array} \qquad \begin{array}{r} 14 \\ +41 \\ \hline \end{array}$$

Objectives:

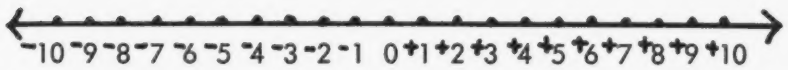
To reinforce addition facts

To introduce Palendromes

Freddy the Kangaroo

Use pages 49 and 50.

Make a number line on the chalkboard or overhead projector from -10 to $+10$.



Introduce Freddy and explain that he likes to carry candy canes in his pocket. The candy canes are numbered and the number on the candy cane tells where Freddy wants to go.

A $+3$ on a cane tells that Freddy wants to go $\longrightarrow$ 3 jumps.

A -3 on a cane tells that Freddy wants to go $\longleftarrow$ 3 jumps.

Give some examples by putting Freddy on any number on the number line. Insert a candy cane and have a child move Freddy where he wants to go. Include several examples involving zero.

Children complete pages 51 and 52.

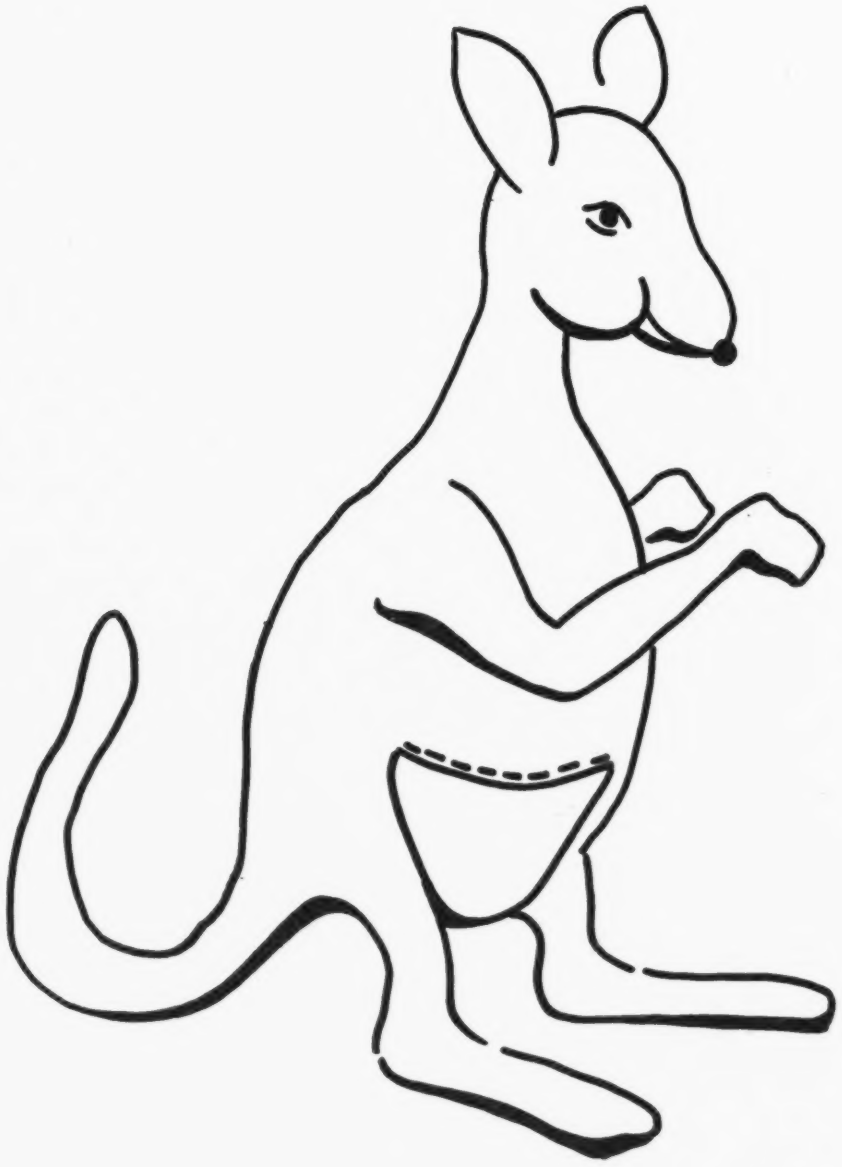
Variation:

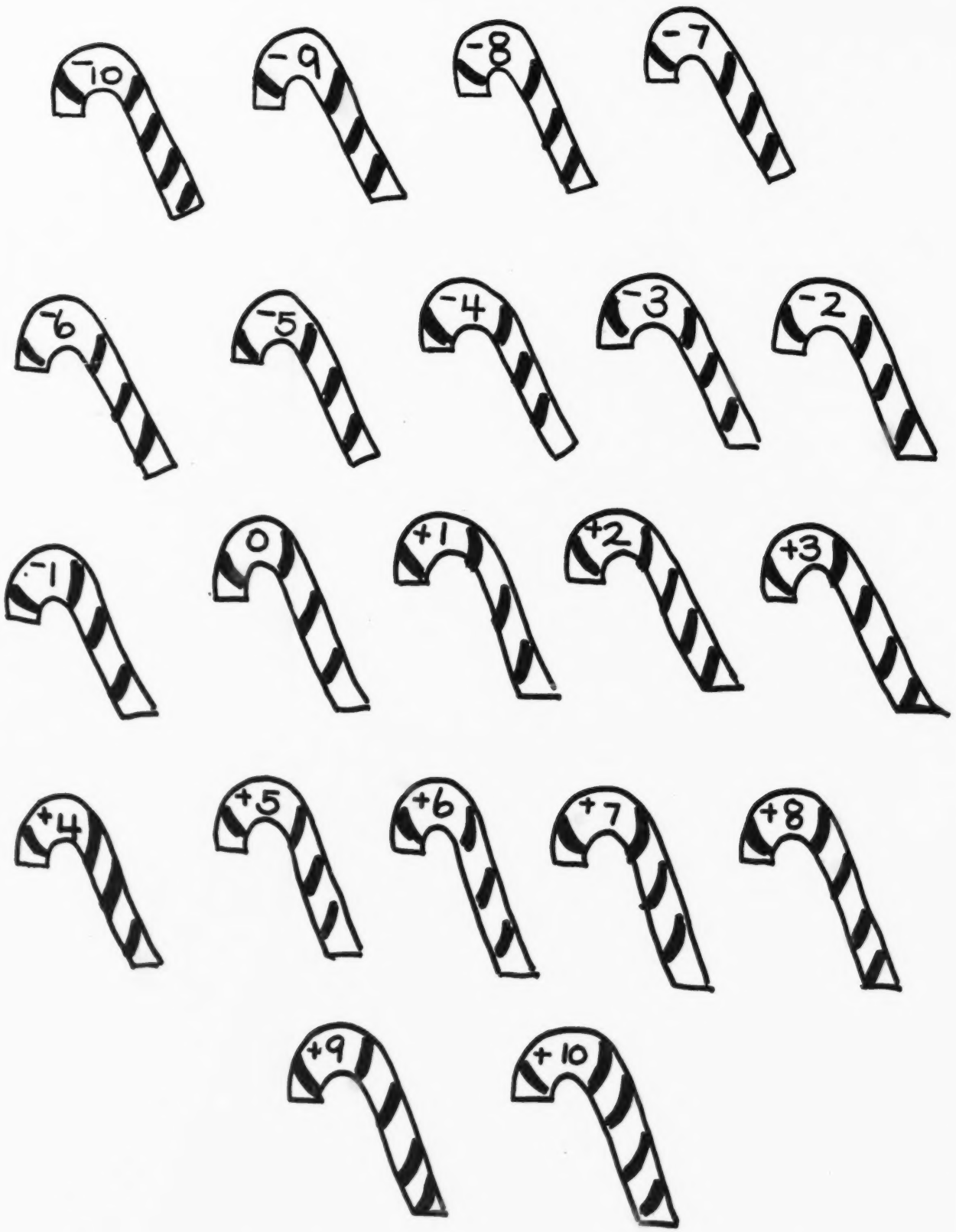
For smaller children use only positive numbers.

Objectives:

To use a number line for addition and subtraction

To build skill in using negative numbers




-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
+1
+2
+3
+4
+5
+6
+7
+8
+9
+10

Freddy the Kangaroo

1. Freddy starts at $+2$. He carries a $+3$ candy cane. He lands on $+5$.

2. Freddy starts at $+4$. He carries a -4 candy cane. He lands on ____.

3. Freddy starts at -3. He carries a -5 candy cane. He lands on _____.

4. Freddy starts at -3. He carries a $+6$ candy cane. He lands on _____.

5. Freddy starts at -2. He carries a 0 candy cane. He lands on _____.

6. Freddy starts at $+4$. He carries a $+3$ candy cane. He lands on _____.

Make up some problems of your own

Freddy

Starts at _____, carries cane _____,
lands on _____.

Starts at _____, carries cane _____,
lands on _____.

Starts at _____, carries cane _____,
lands on _____.

Starts at _____, carries cane _____,
lands on _____.

Starts at _____, carries cane _____,
lands on _____.

Fun With >, <, =

Game for two or more players.

Use page 54.

Players take turns tossing dice and recording the numbers shown on the dice on any two lines on the worksheets. After ten turns, and all lines have a number, a leader calls, "go."

Players then write >, <, or = in each O.

First player to finish his paper correctly wins the game and he may be the leader for the next game.

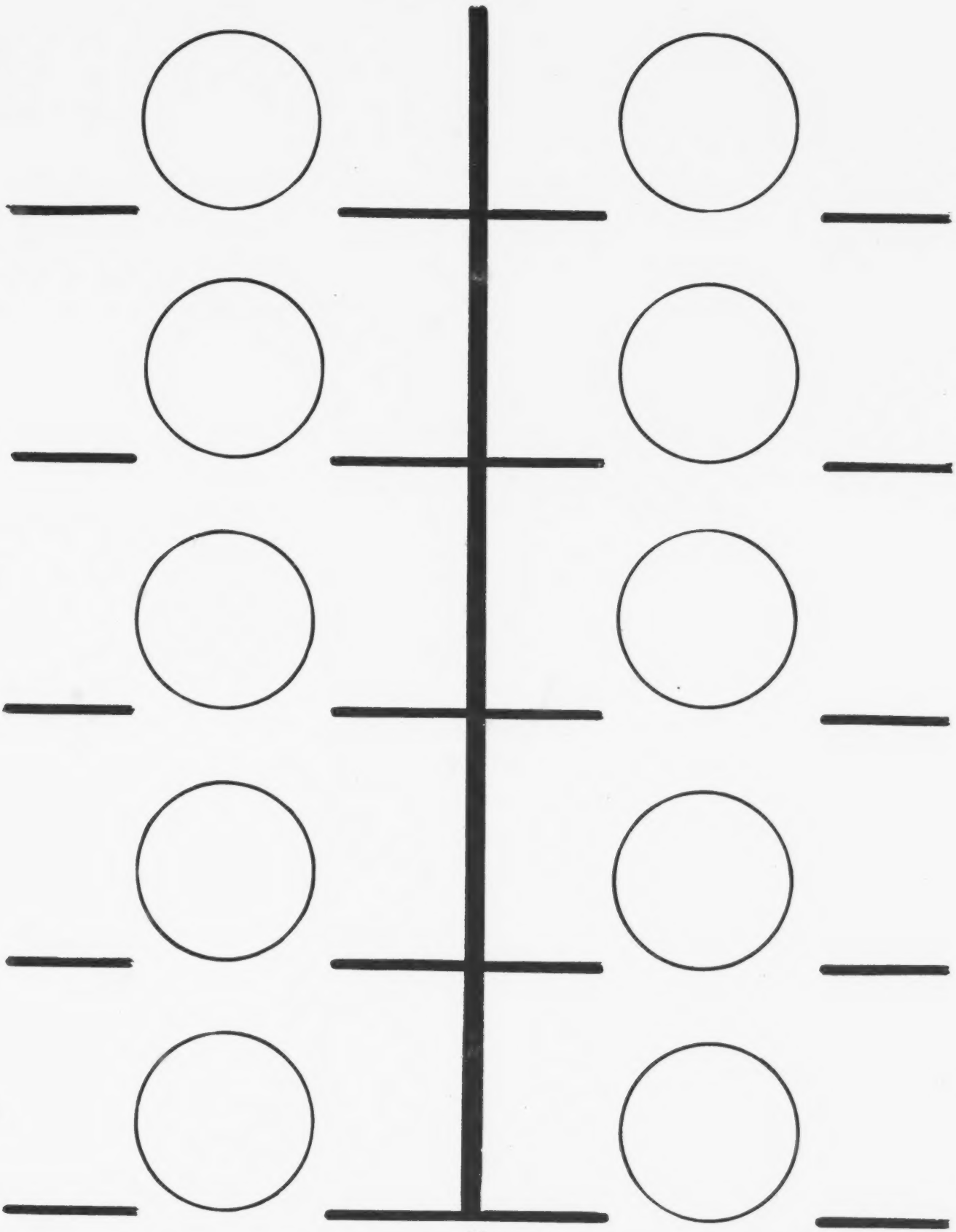
Variation:

Leader tosses the dice for every turn, and children place numbers on any line of their choice.

Objective:

To understand inequalities

>, <, =



Geometry Cards

The Geometry Cards, pages 63-71 (include 26 master cards of squares, triangles, rectangles and diamonds, and 45 sub-set cards. The sub-set cards contain the parts that make up the master cards.)

The cards are designed to build skills in recognizing shapes, visual discrimination, matching, special relationships, and logical thinking.

The following pages offer a few of the numerous games and activities that provide hours of fun and learning for children.

Note:

It is not necessary to discuss the vocabulary with the children unless they ask about it. The purpose of including the geometric words on the cards is so that children will become aware that shapes have names. Repeated use of the cards will familiarize children with these names and many children will learn them on their own.

Objective:

To recognize geometric shapes and their component parts

Card Guessing

A game for two to five players.

A leader selects a master card and places it face down in the center of the group.

All sub-set cards are placed face up in the center.

Players take turns placing a sub-set card beside the master card. If the sub-set card is part of the master shape, the leader allows it to remain. If not, it is to be returned to the set of sub-set cards.

The player who guesses the shape on the master card first is the winner and becomes the leader for the next game.

Geometry Cards

Fast Draw

Game for two to five players.

Shuffle cards and place them face down. (Use the same number of decks for the game as there are players.)

Players take turns drawing a card from the pile.

When a player has drawn a master card and its complete sub-set, he puts it down on the table.

When all cards have been drawn the game ends.

Winner is the player with the most number of complete sets.

Geometry Cards

Filling Wholes

A game for two to five players.

Players use one deck of cards.

Players place all the master cards for three different shapes face up in the center. The sub-set cards that go with the master cards are placed face down.

Players take turns drawing a sub-set card. If the card belongs to one of the master cards in the center, the player places it on that master card.

Players must match sub-sets correctly. If the first card placed on a master card is an angle, then all the other sub-set cards for that master card will be angles.

Players have to keep any cards they cannot play.

Game is over when all cards have been drawn.

Winner is the player with the least number of cards in his hand.

Geometry Cards

Follow the Leader

Teacher introduces the activity by selecting a master card and, not letting anyone see it, gives directions telling how to make the shape shown on the card. The children are to follow the directions exactly as given to discover what shape has been selected.

Example:

Make a point. Go across a short distance. Stop. Do not lift the pencil and go the same distance down. Do not lift the pencil and make a straight line back to the beginning point.

(a triangle)

After the children understand what to do, a leader is selected. The leader draws a card and gives the directions.

When the leader is finished, the children can share their interpretations of the directions.

Geometry Relay

A game for two or more players.

Give each player a set of geometry cards.

Players shuffle their cards.

When given the signal to "Go," each player makes as many matching pairs as fast as he can.

First player to match all the pairs in the deck is the winner.

Variation:

Match master cards with sub-set cards.

Geometry Cards

High Toss

A game for 2 to 6 players.

For 2 players use 1 deck of cards.

For 4 players use 2 decks of cards.

For 6 players use 3 decks of cards.

Separate master cards from the sub-set cards. Sub-set cards are placed face down.

Players take turns tossing a die and taking as many sub-set cards as indicated by the toss. When a player gets a complete sub-set he may take the master card that goes with it.

After all the cards have been drawn, the player with the most number of master cards is the winner.

Geometry Cards

Take One

A game for 3 players.

Use pairs of master geometry cards.

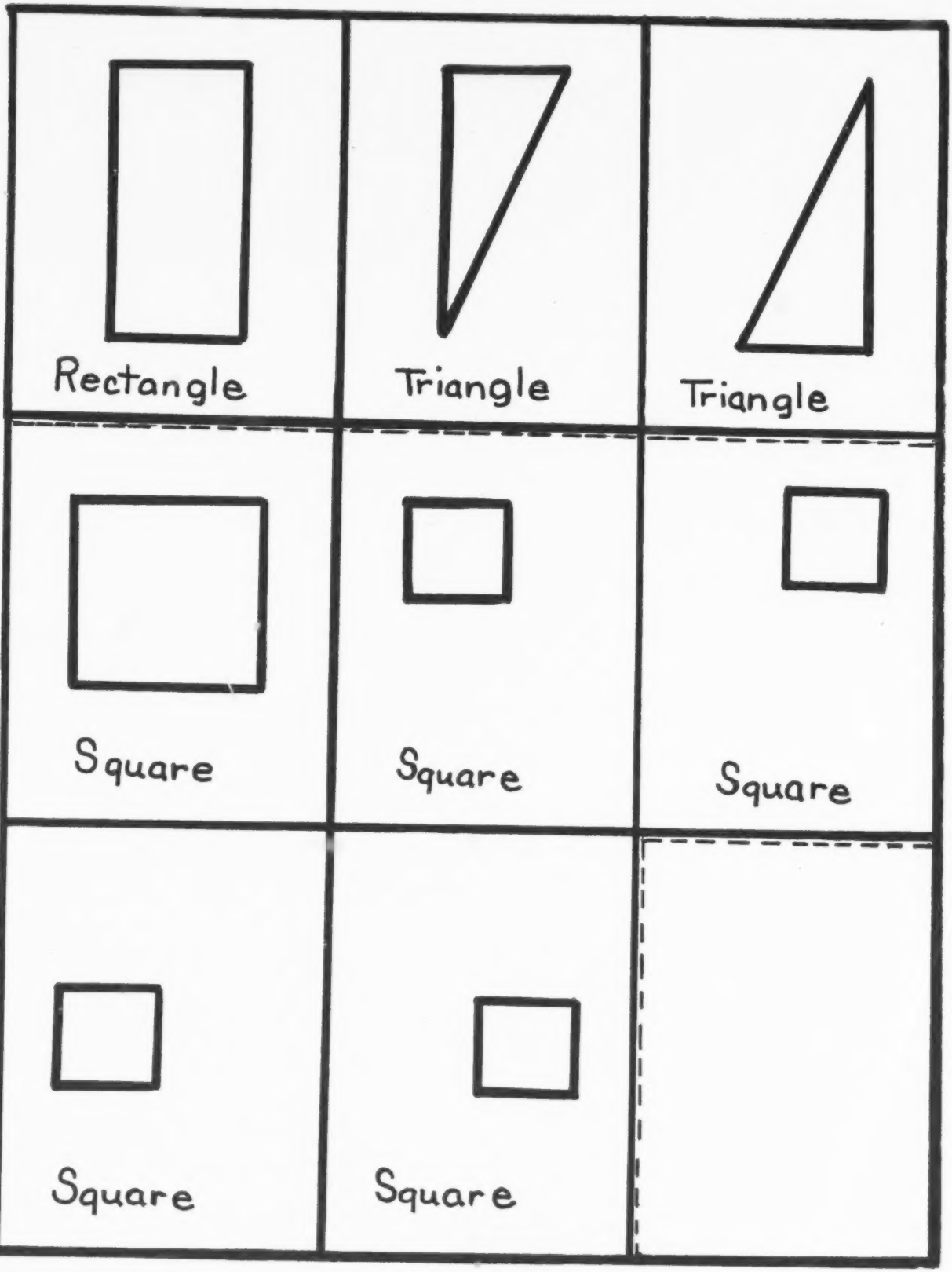
Cards are shuffled and evenly distributed to each player.

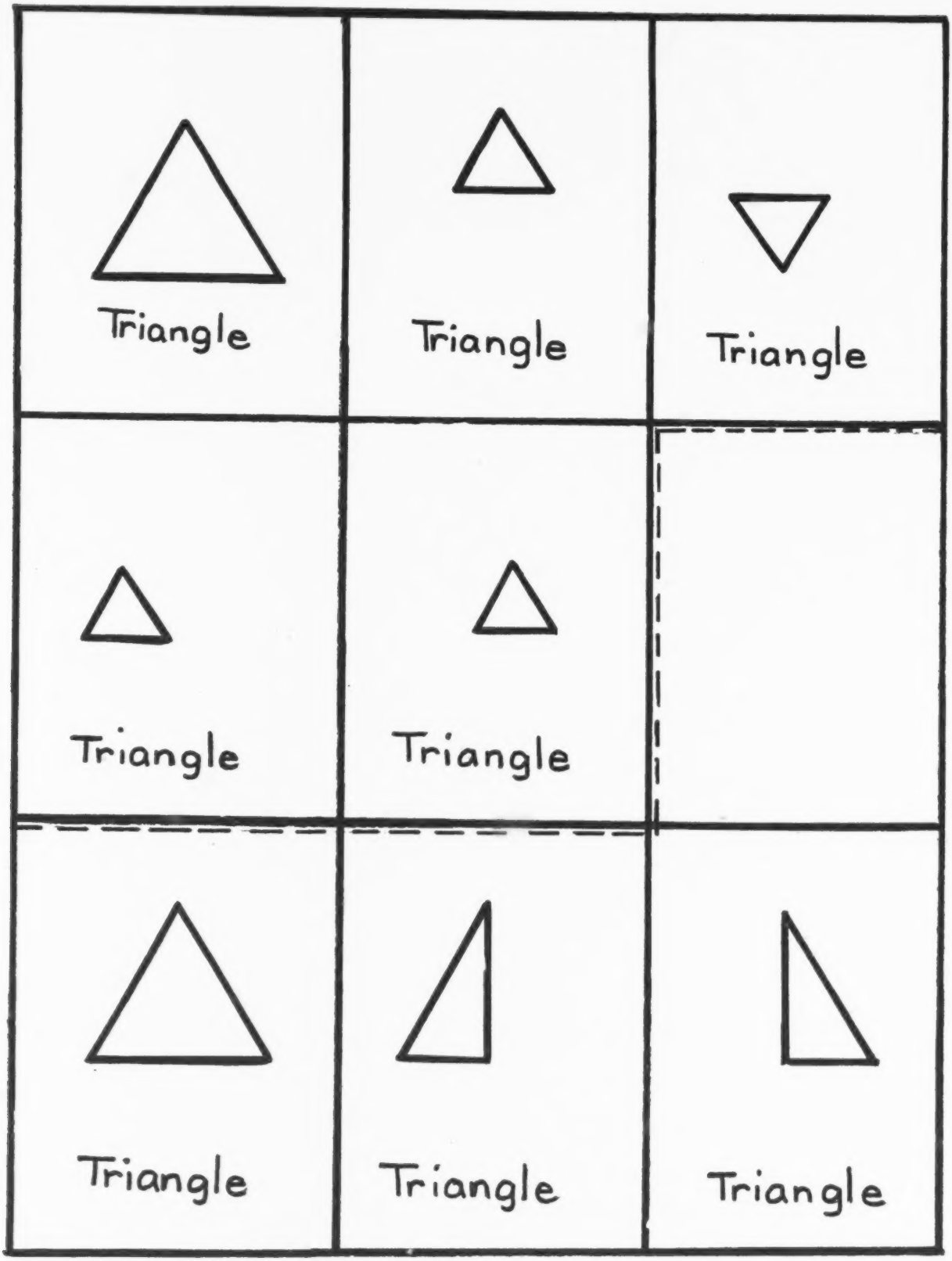
When all cards are dealt, players match pairs, (any two cards that are alike), take them out of their hand and set them aside.

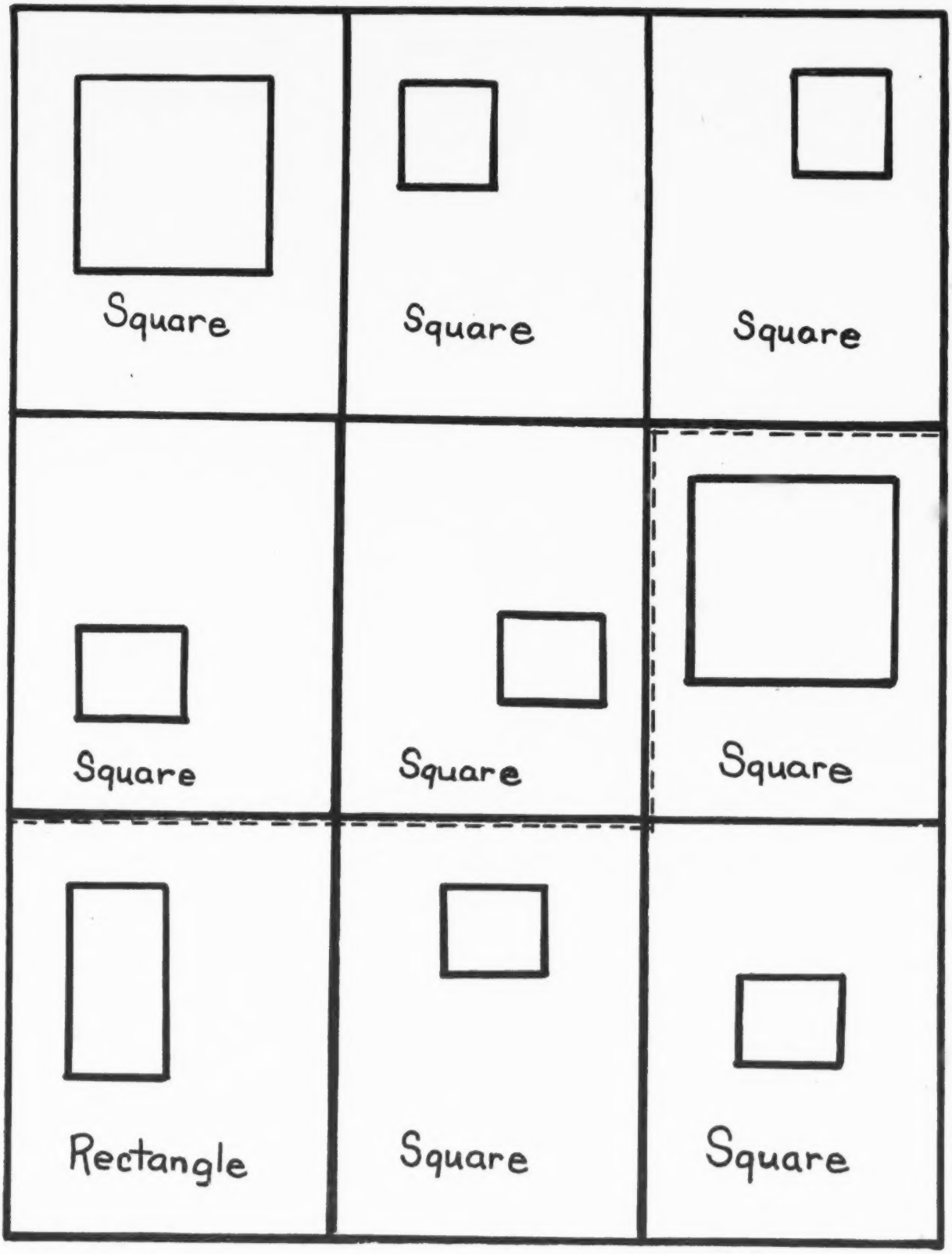
Players then take turns drawing one card from either of the other players he chooses. When he draws a card that will match one in his hand, he adds that pair to his pile.

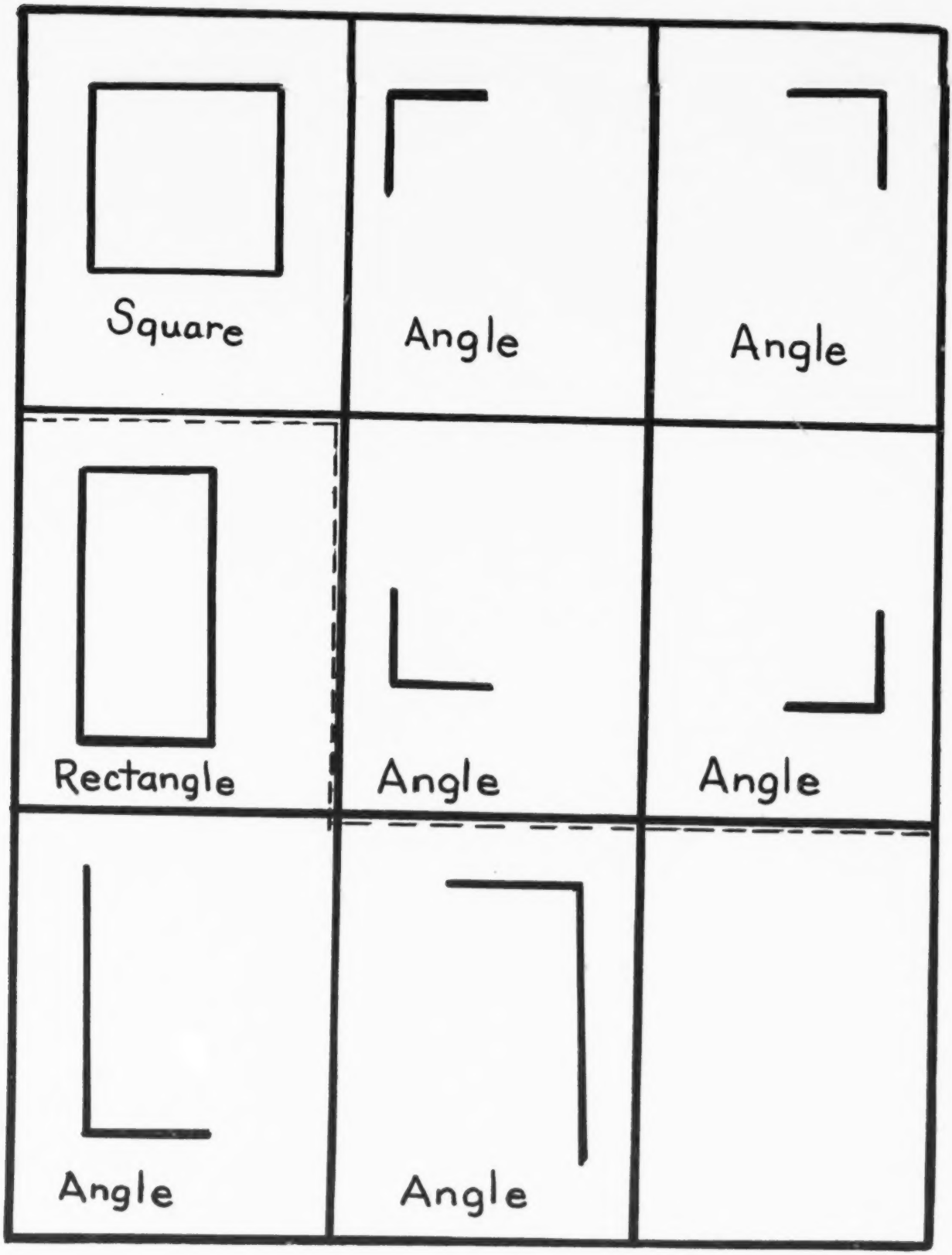
Play continues until all pairs have been matched.

Player with the most pairs is the winner.


Rectangle
Triangle
Triangle
Square
Square
Square
Square
Square


Triangle
Triangle
Triangle
Triangle
Triangle
Triangle
Triangle
Triangle
Triangle


Square
Square
Square
Square
Square
Square
Rectangle
Square
Square


Square
Angle
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Rectangle
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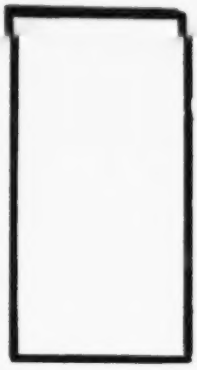
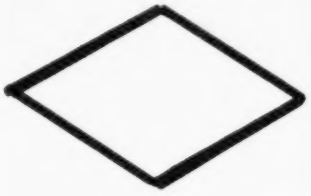
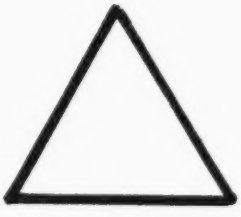
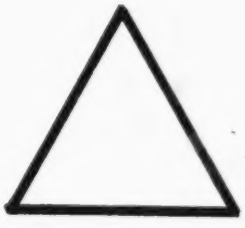
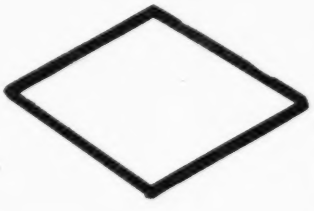
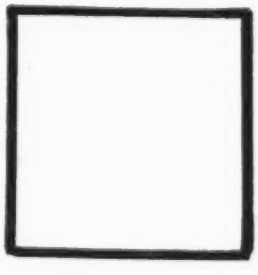
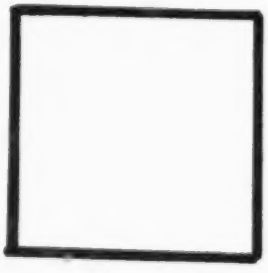
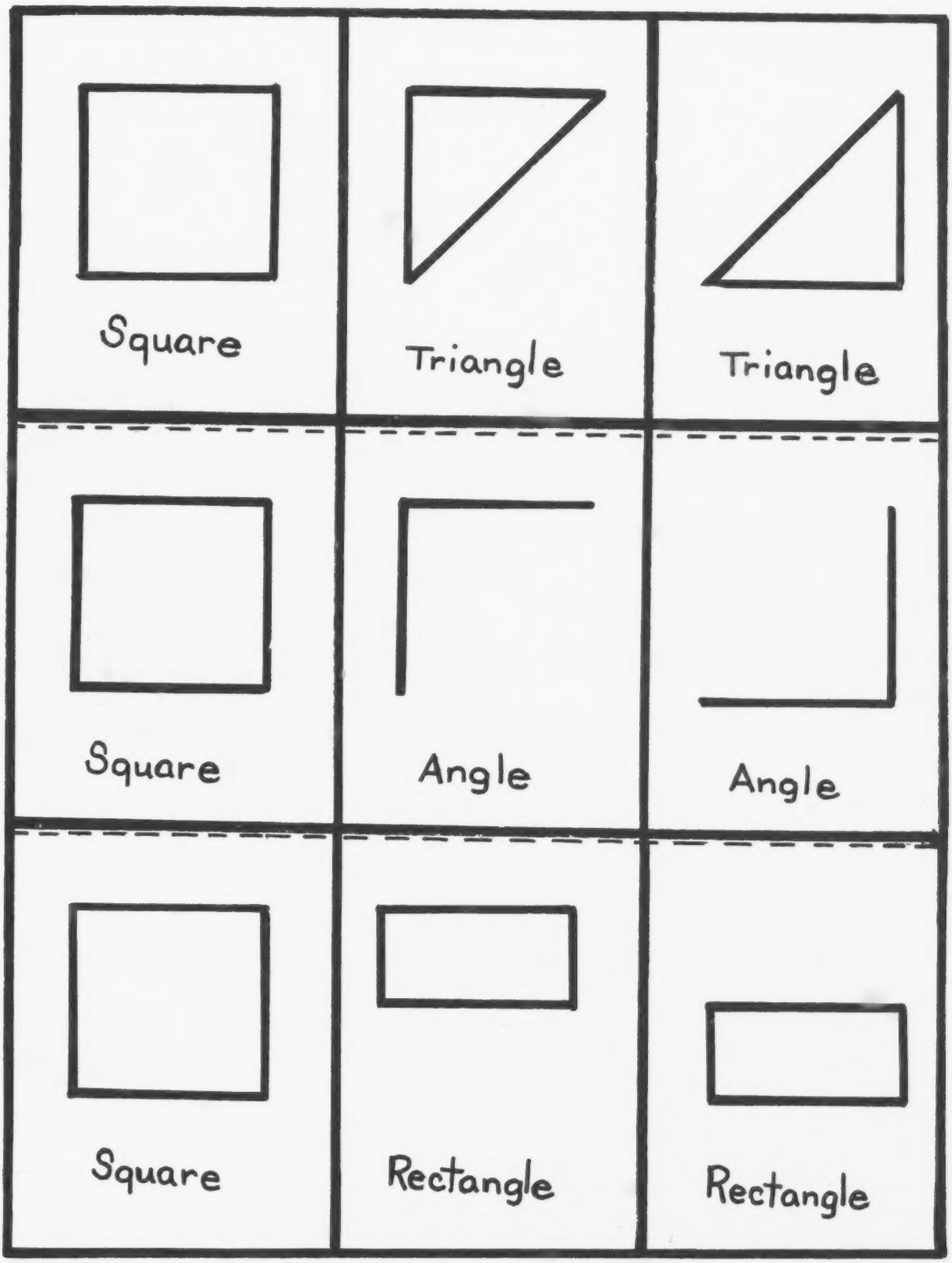
Rectangle	 Rectangle	 Diamond
 Triangle	 Triangle	 Diamond
 Square	 Square	


Square
Triangle
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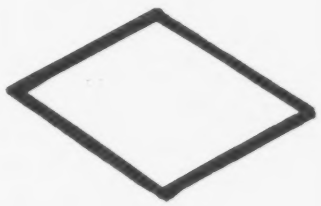
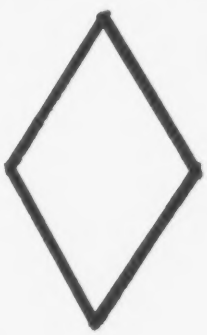
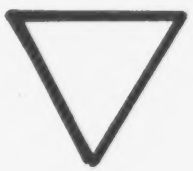
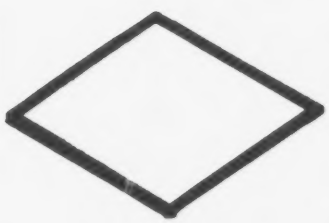
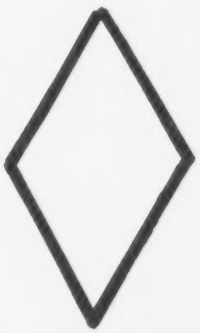
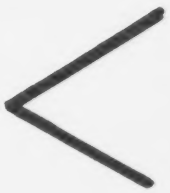
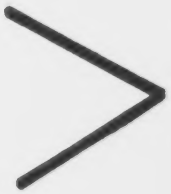
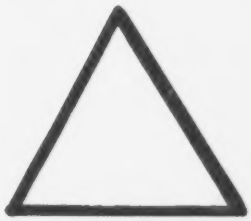
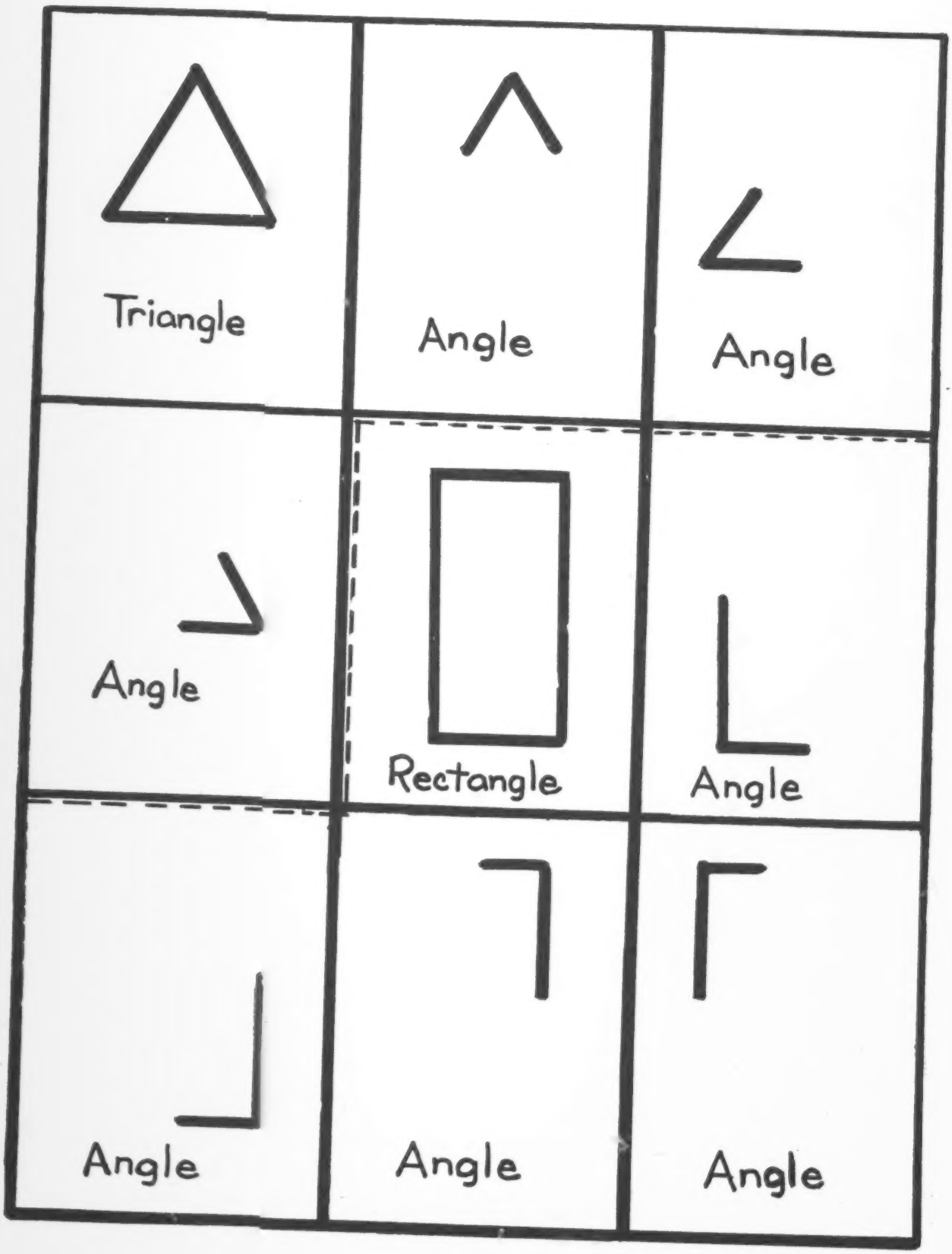
 Diamond	Angle	Angle
 Diamond	Triangle	 Triangle
 Diamond	Triangle	Triangle

 Diamond	 Angle	 Angle
 Triangle	Angle	Angle


Triangle
Angle
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Go!

Game for 2 to 5 players.

Use the 26 cards on the next 5 pages.

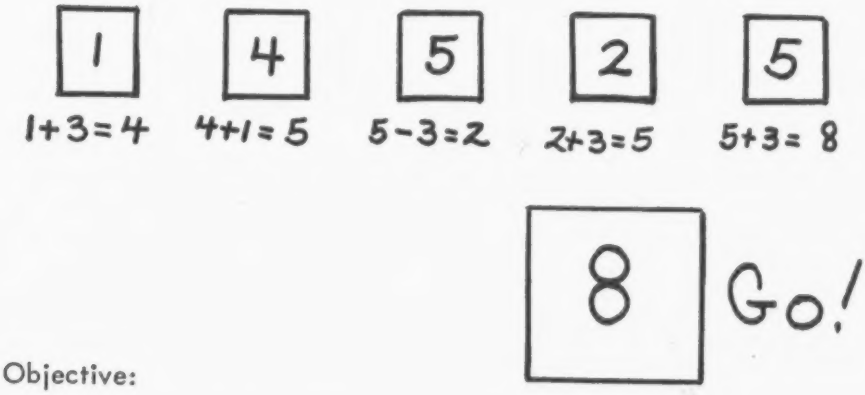
Dealer passes out five cards, face down, to each player. Then he places a card, face up, in the center of the table. This is the "Go!" card.

As soon as the "Go!" card is shown, players turn their cards over and line them up.

Players try to equal the number on the "Go!" card by making up a math sentence starting with the number on the first card, to equal the second card. Then he uses the number on the second card in a math sentence to equal the third card, until all cards are used.

Winner is the player who reaches the "Go!" card first. The game stops and the winner must repeat his sentence to all the players. If the player gives an incorrect sentence, he is out of the game and play continues until there is a new winner.

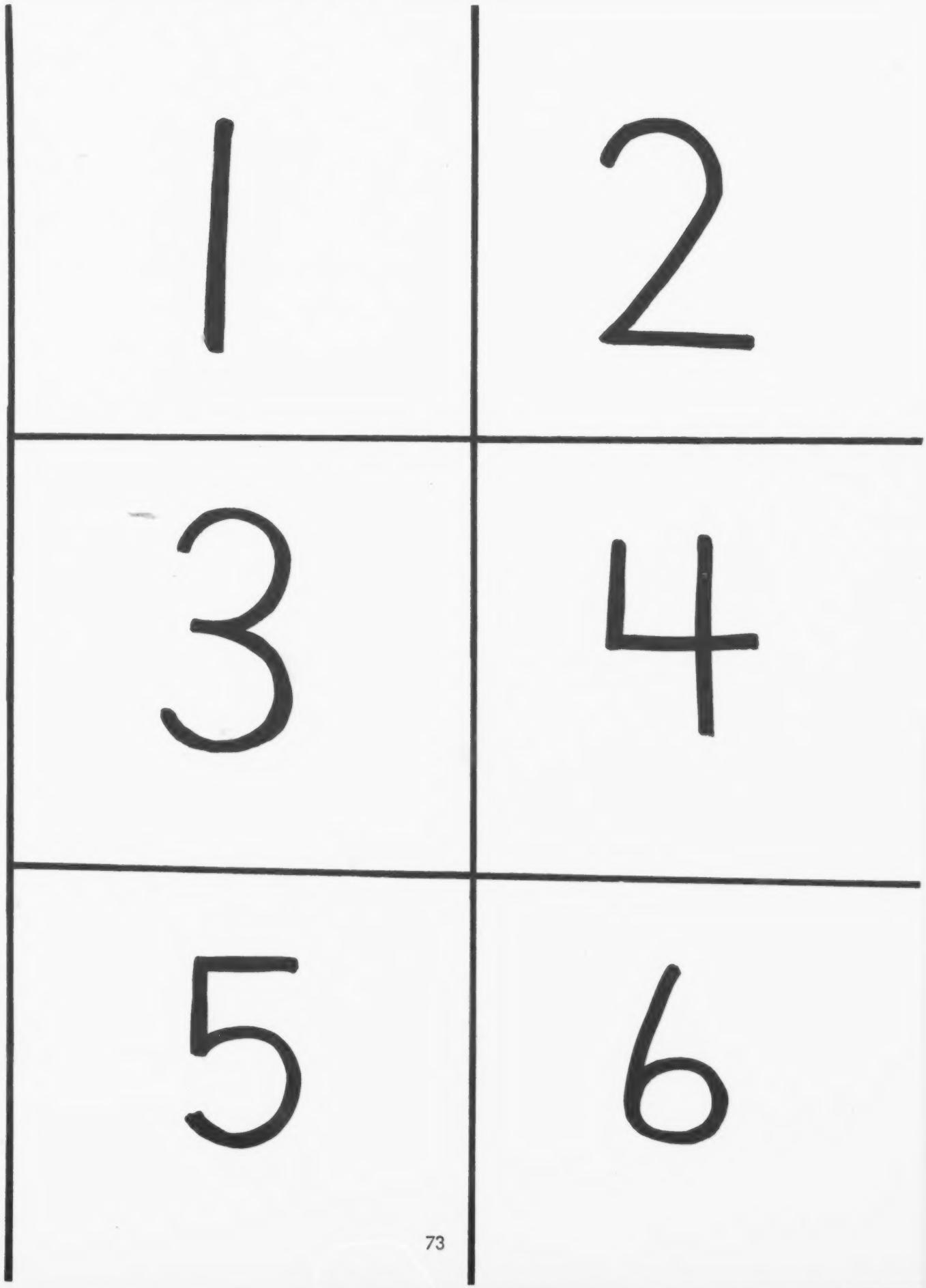
Example:



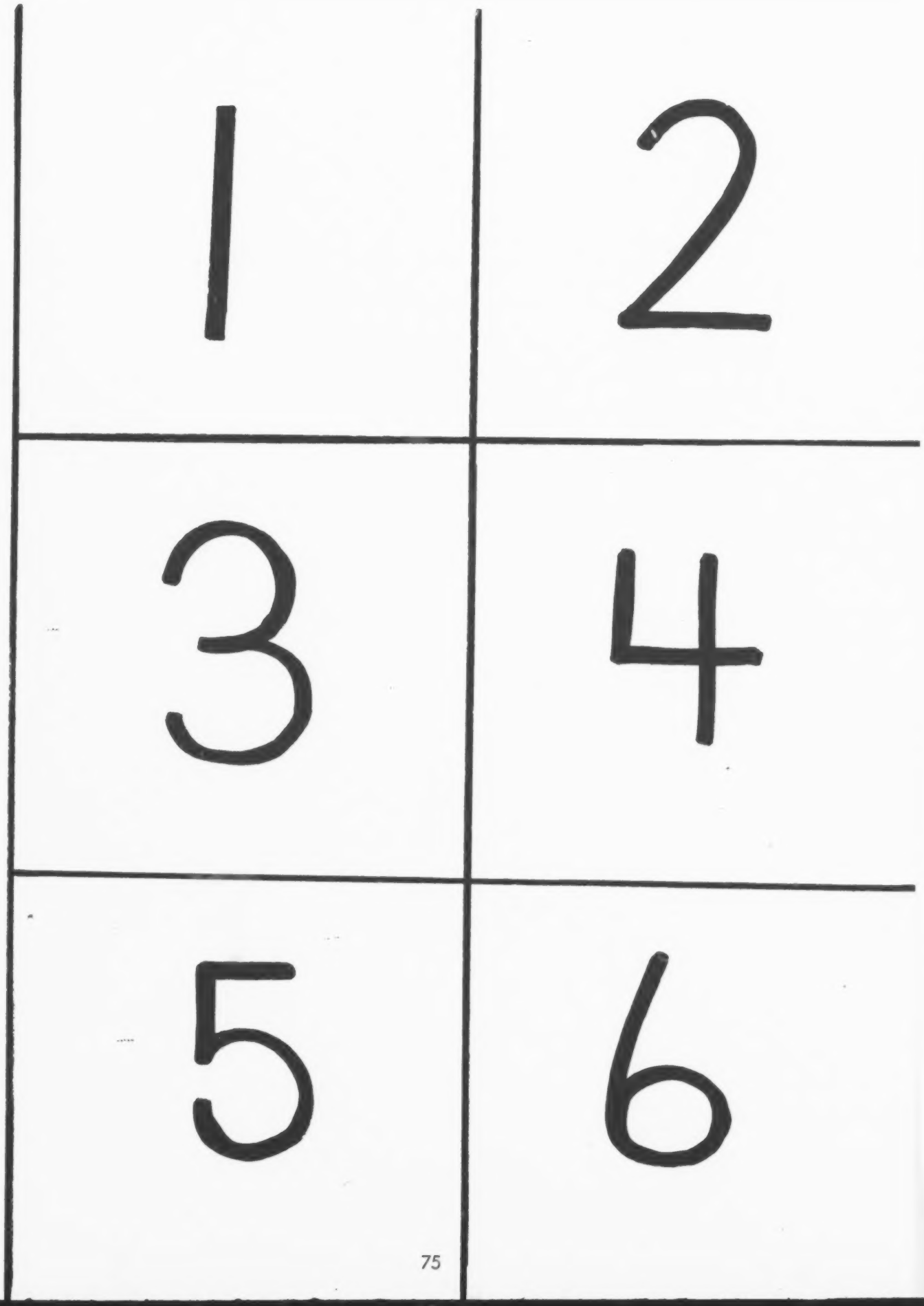
Objective:

To reinforce basic addition and subtraction facts

To understand that addition increases a number and subtraction decreases a number


1
2
3
4
5
6

7	8
9	10


1
2
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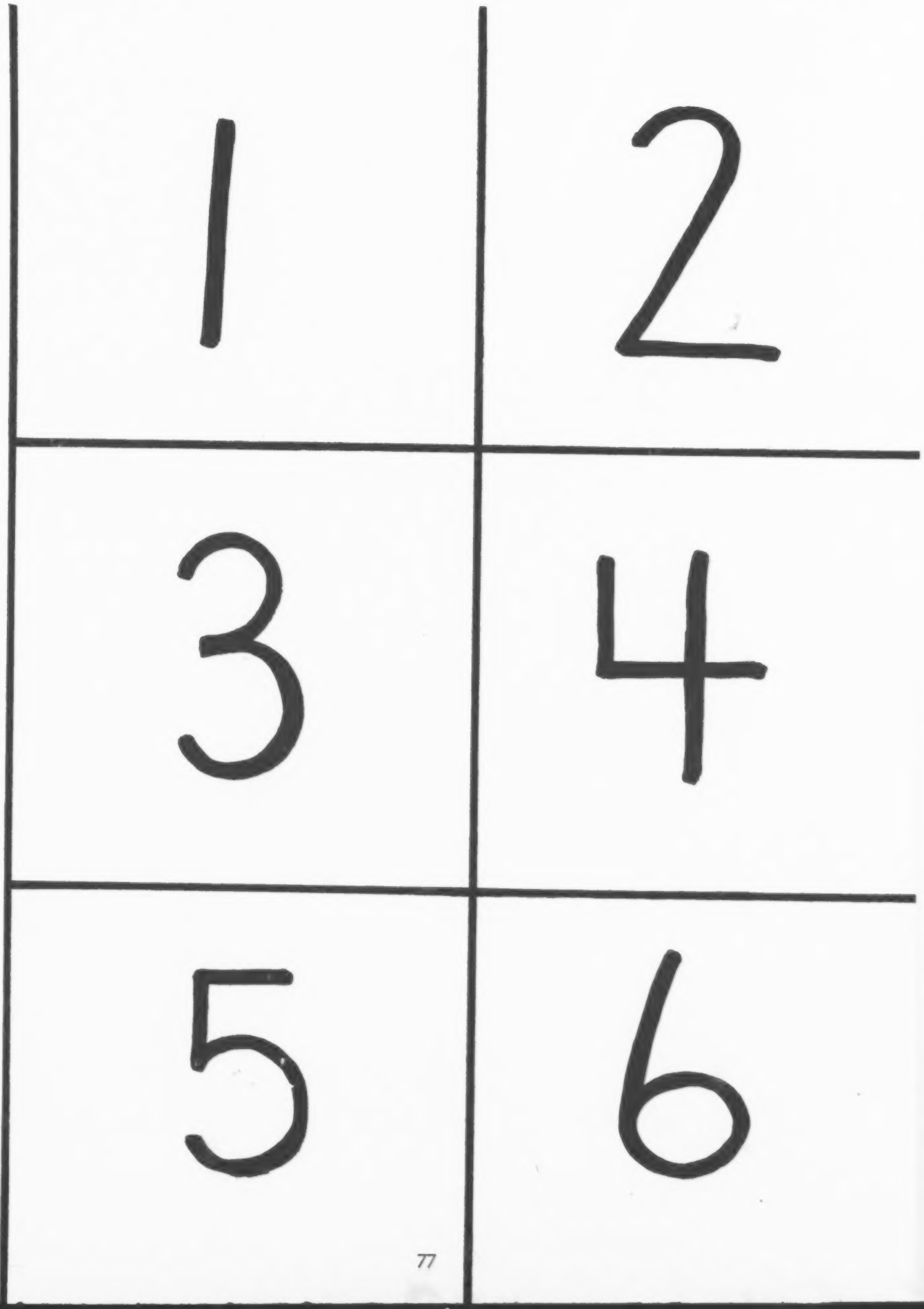
7	8
9	10


1
2
3
4
5
6

Grab Bag Graphing

Each child has his own grab bag of shapes.

Use page 79.

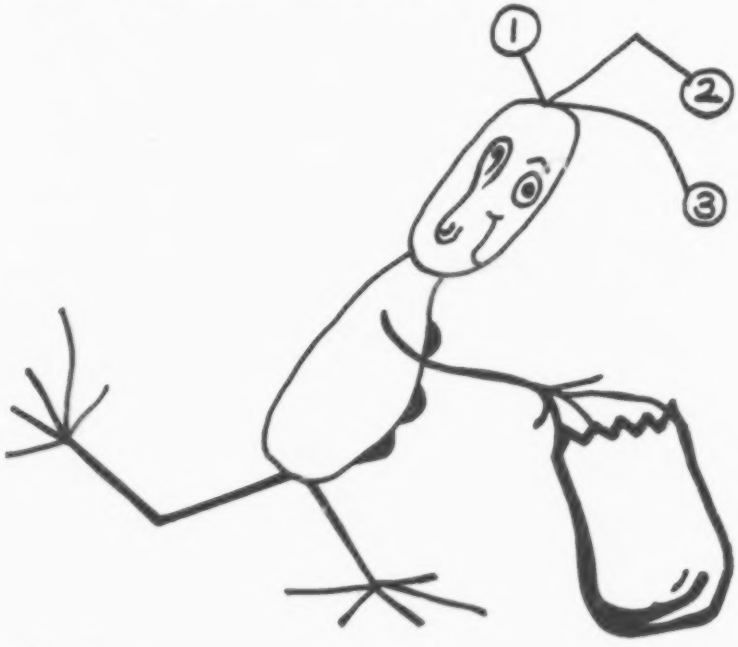
Put shapes inside a paper bag and shake them up.

Have children draw out five shapes without looking.

Pass out graph on page 80 for children to make a picture of their collection. Have them trace each shape drawn from the bag in one of the squares. Keep shapes in the correct row.

Let them count how many shapes are in each set. Encourage children to compare their graphs.

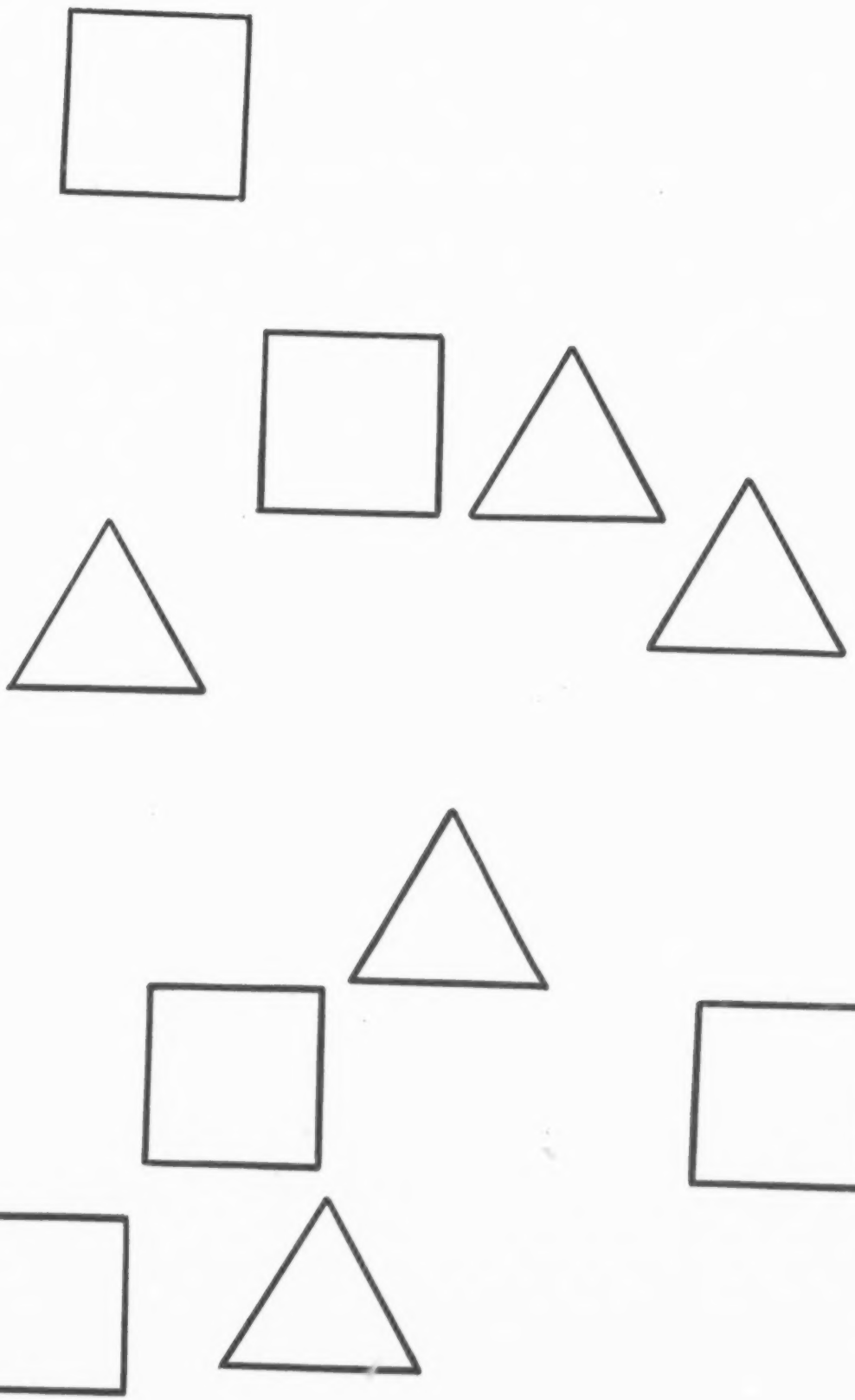
Talk about: greater than, less than, equal, how many ways could they have been selected, etc.

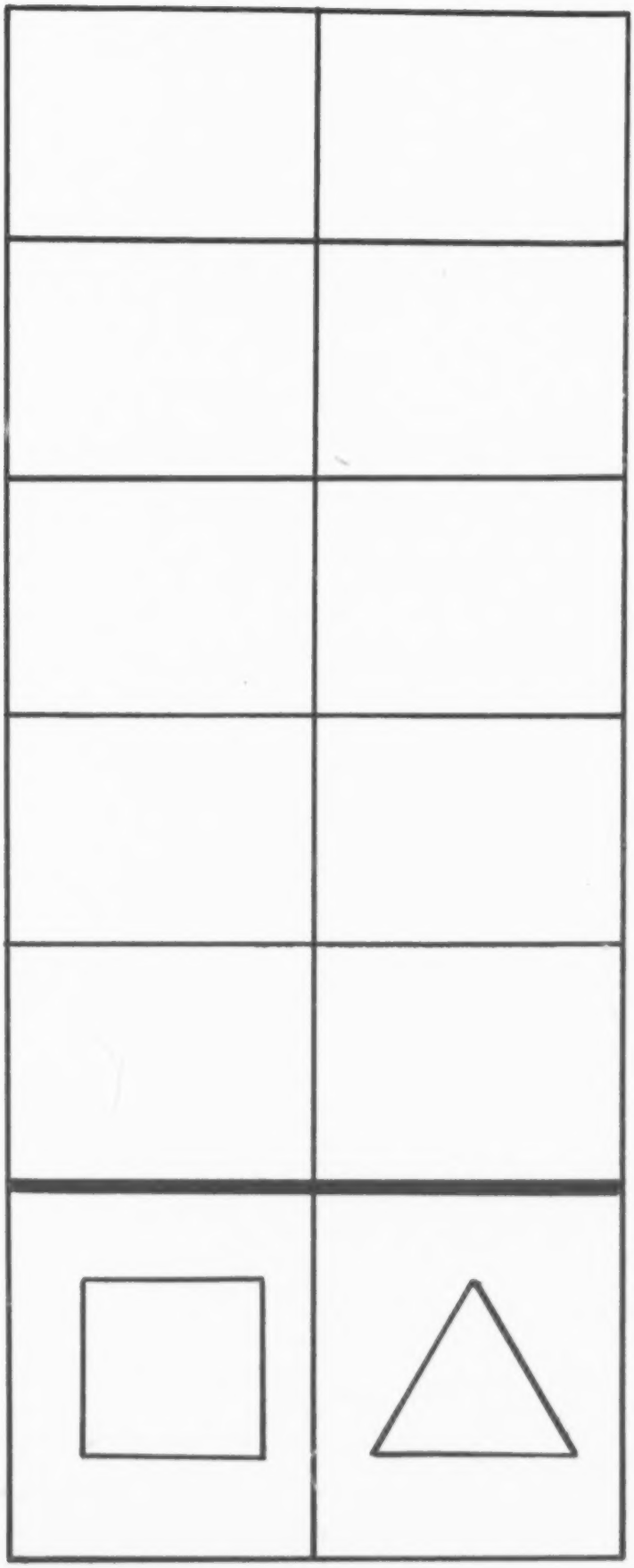


Objectives:

To construct bar graphs from self-gathered data

To use counting to determine more, less, and equal





Guesstimation

Toss a handful of large objects such as blocks, oranges, empty cartons etc. on the table. Leave them for a few seconds, then cover them.

Ask the children to guess how many were in the group. Let them prove their guess by counting.

Next, toss smaller objects such as erasers, pencils, rulers, compasses etc. Have children guess the number and prove by counting. If this skill is mastered, try even smaller objects such as popcorn, kidney beans, paper clips, toothpicks etc.

Encourage children to round the numbers to the nearest 10. Accept the nearest rounded number.

Find ways to short cut the counting. For example: 50 beans fill one paper cup, so find out how many cupfuls there are.

Objectives:

To develop skill in estimation and number sense

To develop counting strategy

I Have an Area ---Copy Me

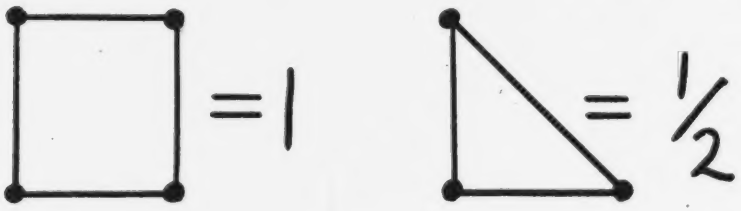
Use pages 84 to 90.

Give children several copies of page 90 and have them copy the designs on pages 84 to 89.

Teacher may enlarge these and display on chalkboard, or show them on an overhead projector.

Explain that the distance inside four square dots represents an area of one.

Have them mark the squares and half squares, (triangles) in each figure, add them and find the area for each shape.



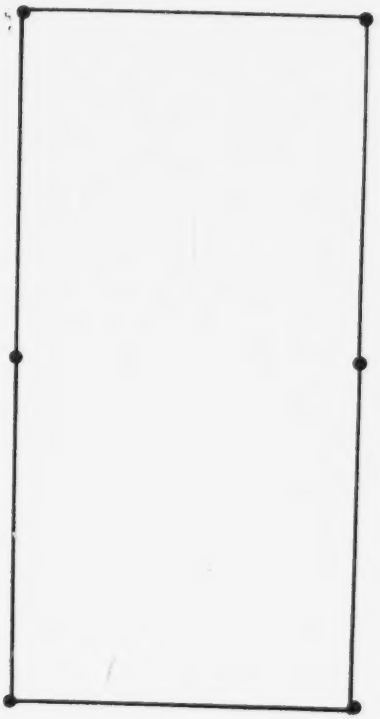
Variation:

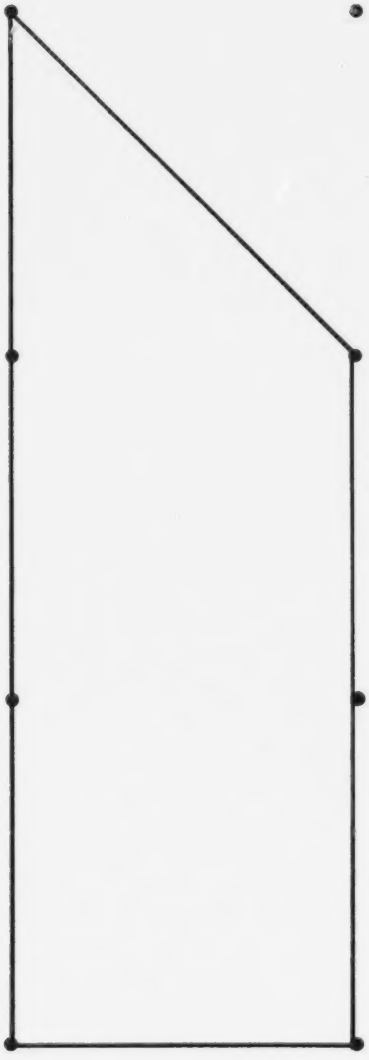
Teacher stimulates children to make and add their own figures.

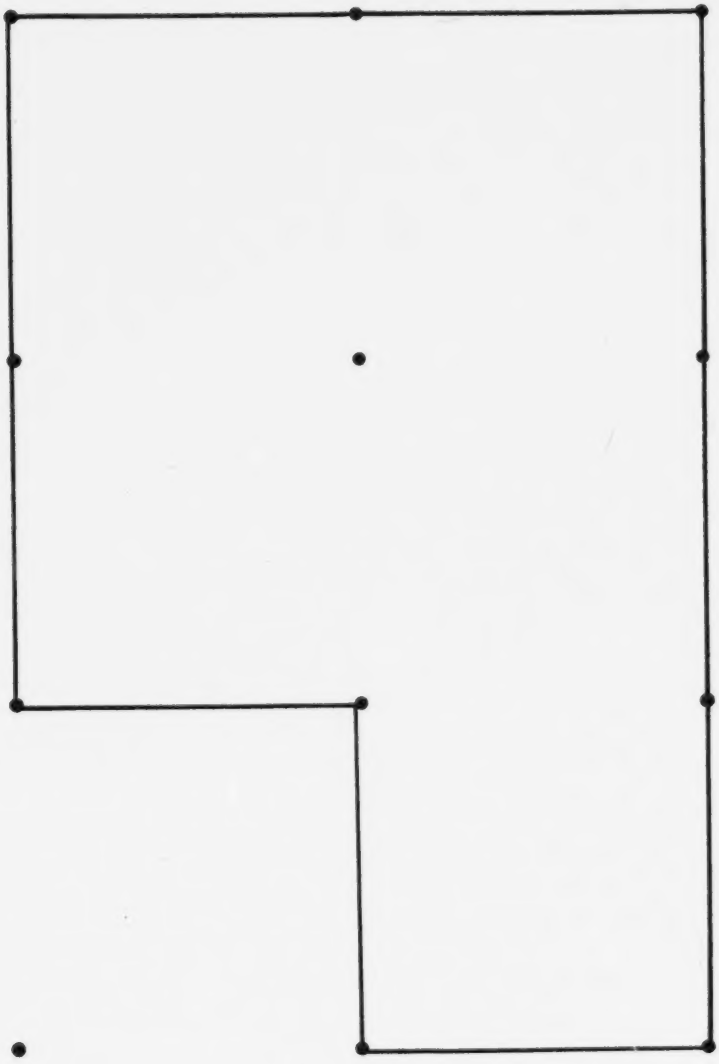
Example: Make a 5, 3, 2 1/2, or 7 1/2 shape.

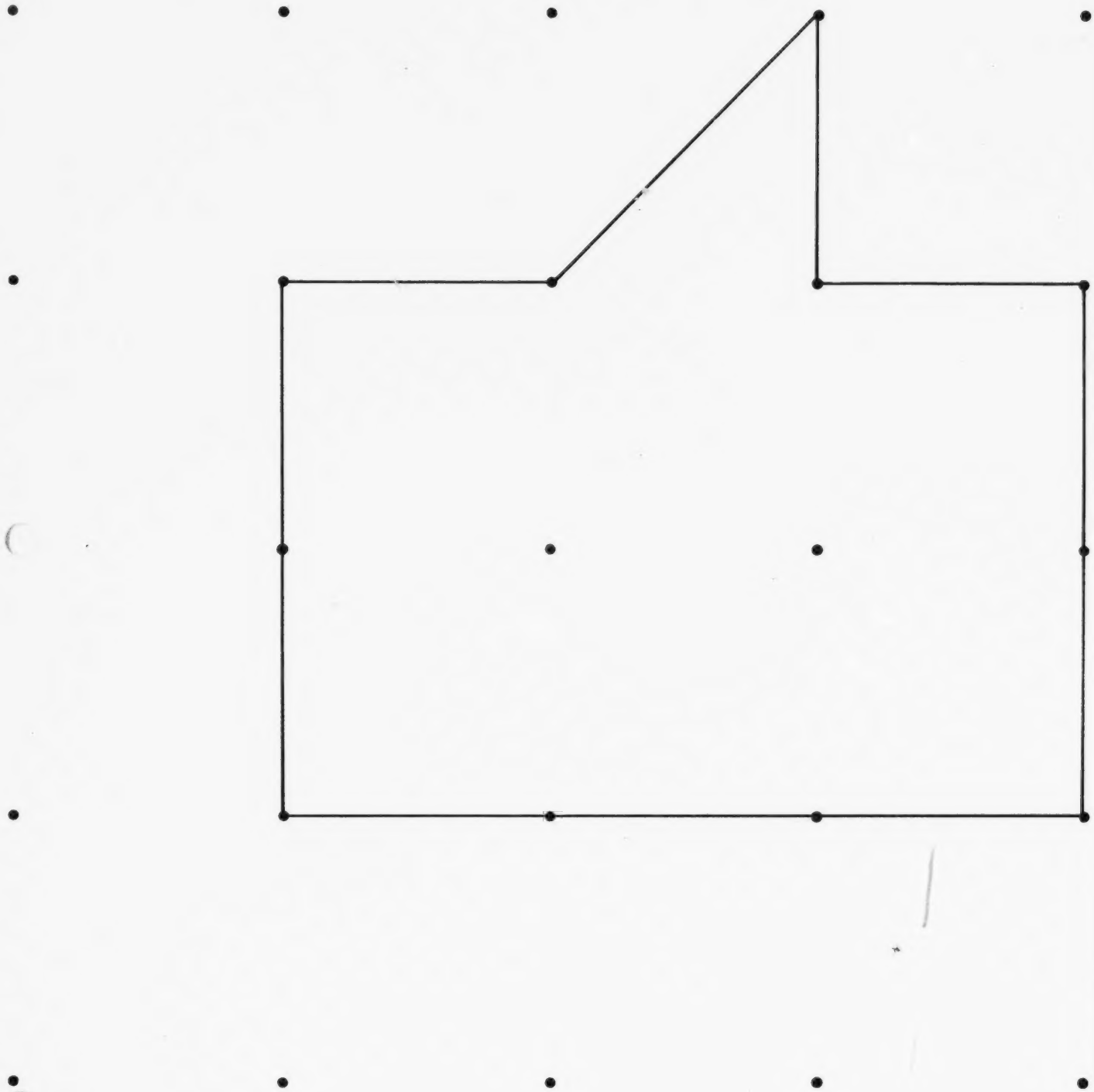
Objective:

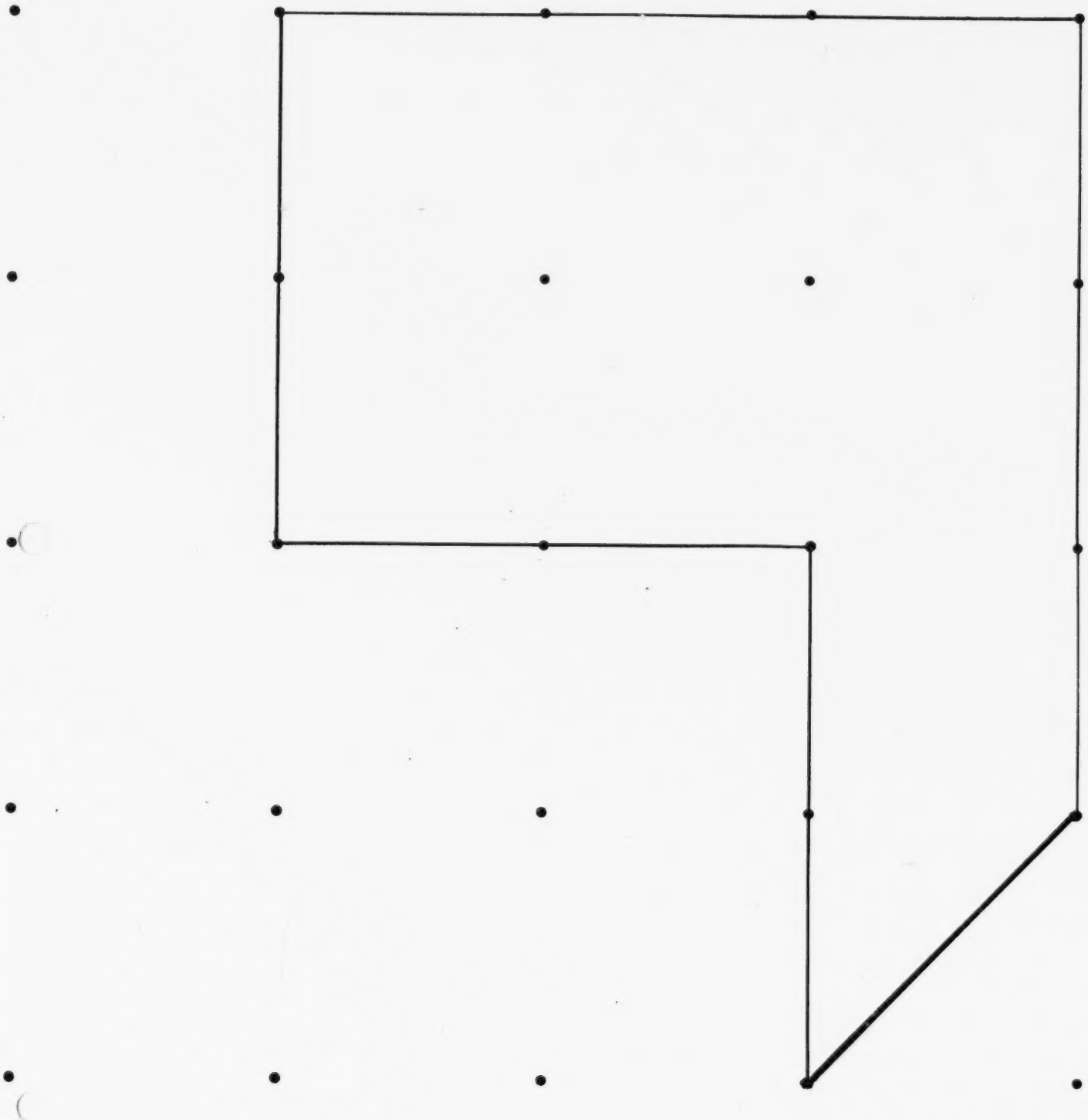
To understand and find area

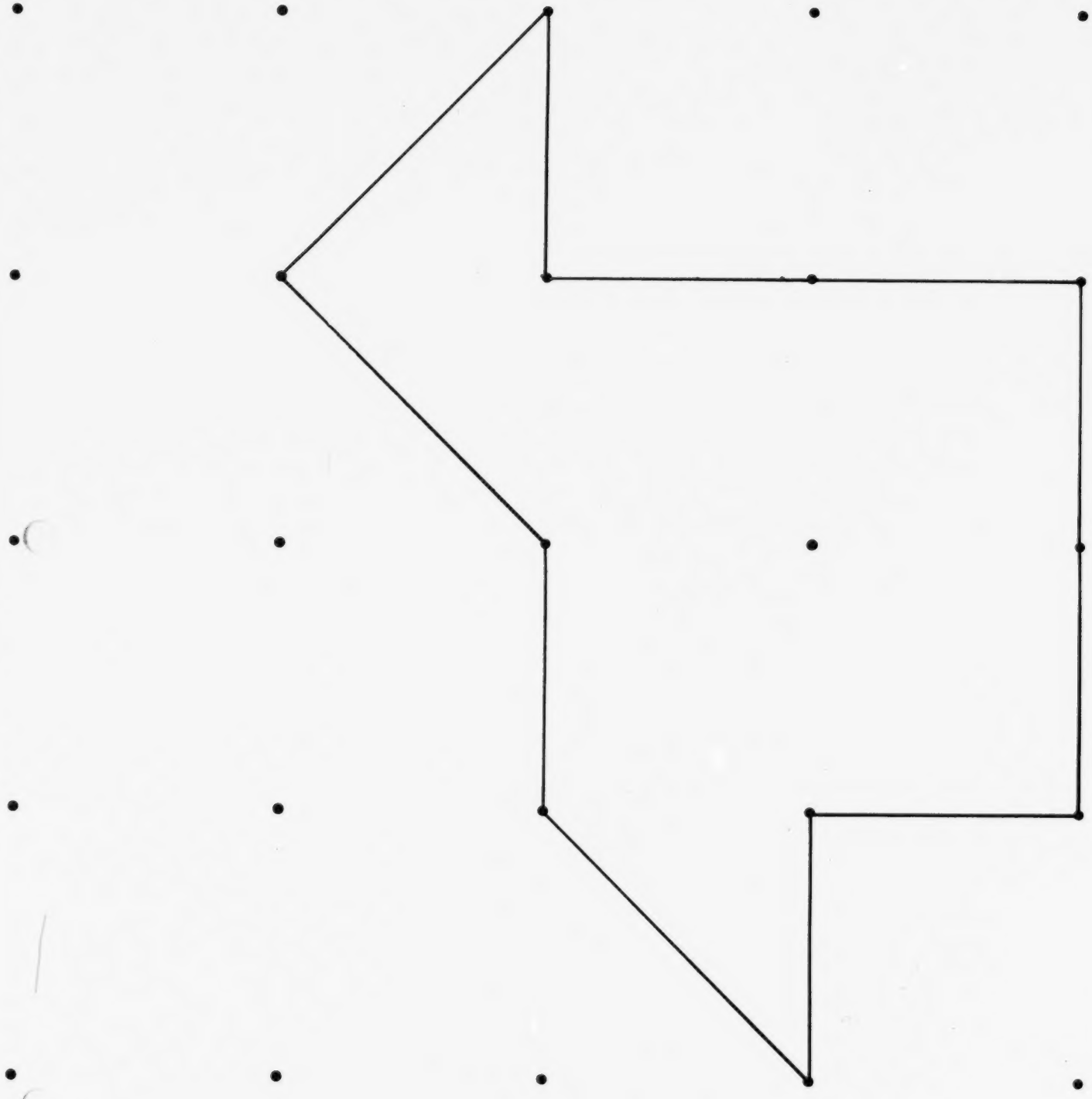












It Makes Cents

Activity for small group or entire class.

Supply addition/subtraction flash cards.

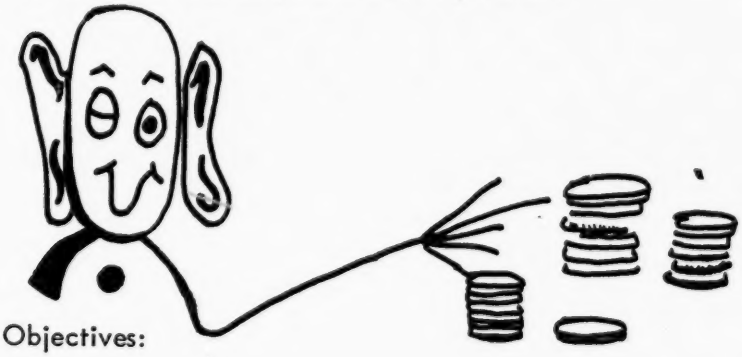
Supply play money.

A leader holds up the cards one at a time. The players take turns giving the correct answer. For each correct answer, players are given a play penny. If a child does not know the answer, or gives an incorrect answer, the card is shown to the next player. This continues until a player gives the correct answer and receives his penny. Then another card is shown.

Whenever it is a player's turn, he may make trades with the leader for other coins. If he has 5 pennies he may trade for a nickel, 10 pennies for 2 nickels, 5 pennies and one nickel for a dime, etc.

At the end of a predetermined amount of time, the players count their money. Winner is the player with the most money.

If the players put their money in envelopes, they can be put aside and used another time, giving the players an opportunity to exchange and add larger sums.



Objectives:

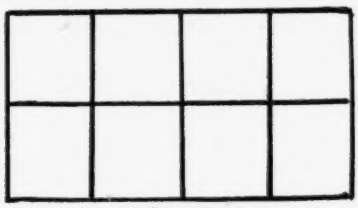
To regroup sums of money

To build addition/subtraction skills

Math Waffles

Use page 93.

Have children cut their papers into all different sizes of rectangles.



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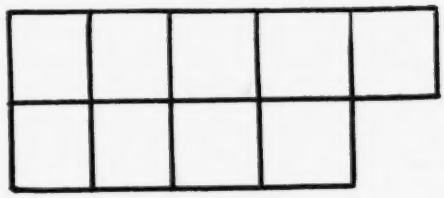

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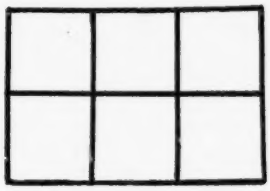
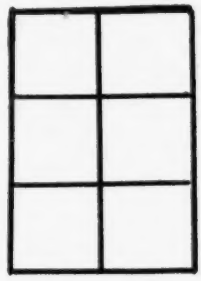
Have children label their rectangles by rows and columns.



2 x 3
(2 by 3)



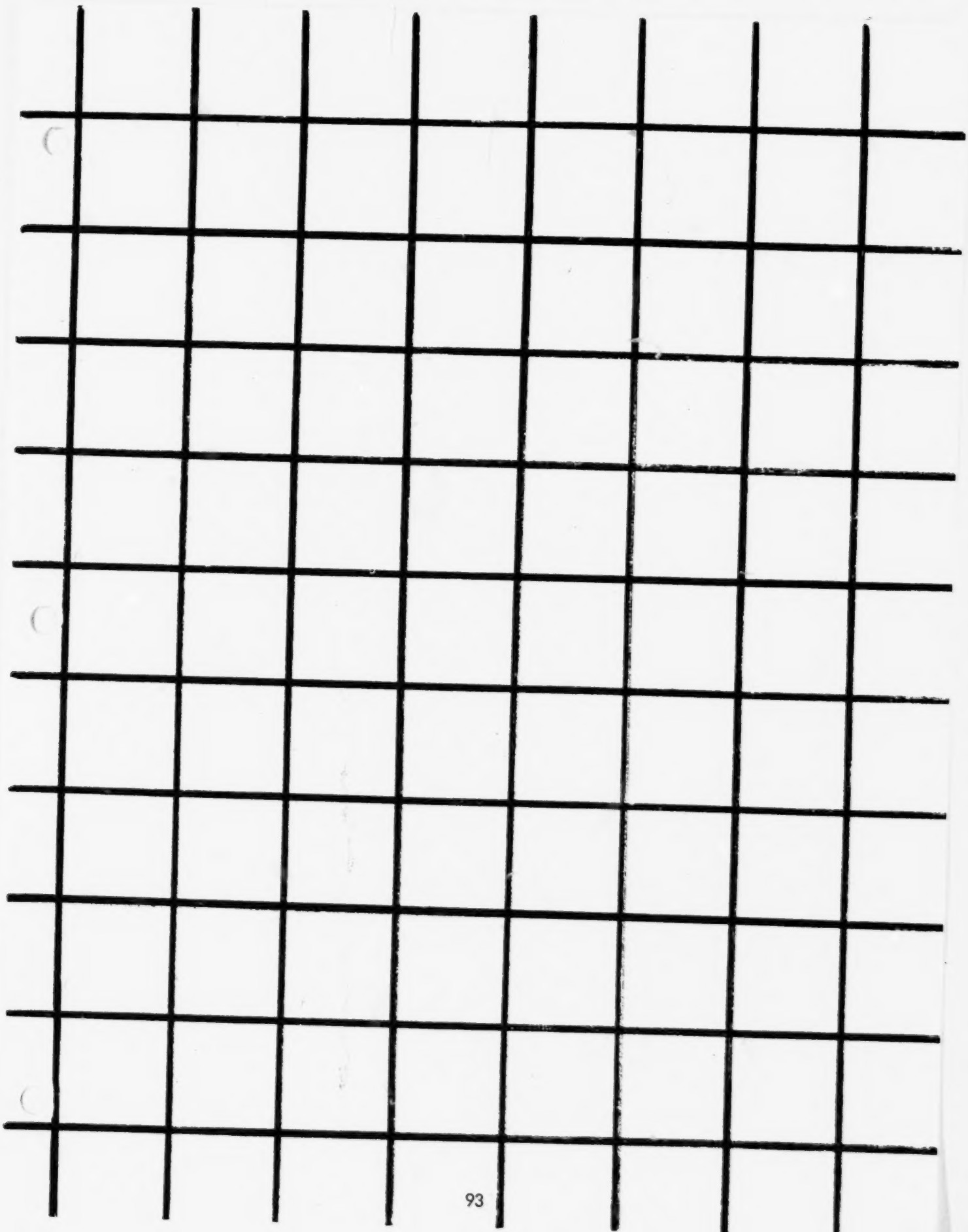
3 x 2
(3 by 2)

Classify rectangles by 2's, 3's, 4's etc. or by any other classification.

Discuss patterns and relationships. Note that a 3 x 2 rectangle is the same size as a 2 x 3 rectangle. A 3 x 3 rectangle has one more row, with 3 squares in it, than a 2 x 3 rectangle.

Objective:

To understand the operation of multiplication

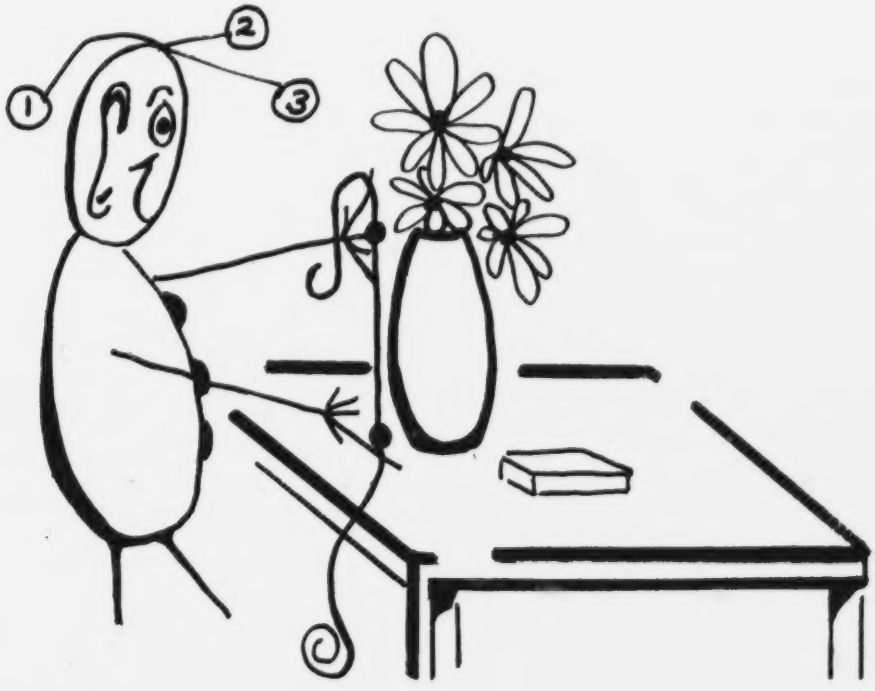


Measure of the Day

Display a piece of yarn that measures some object in the room such as the width of a chair, length of the chalkboard eraser, height of the vase on teacher's desk, etc.

Children take a paper and either write the name, or make a drawing of the object they think the yarn measures. They drop their guess in the answer box.

At the end of the day, take the yarn down and have children prove which object was the measurement of the day.



Objective:

To build skills in estimating linear measure

Mini-Hex

A game for two players.

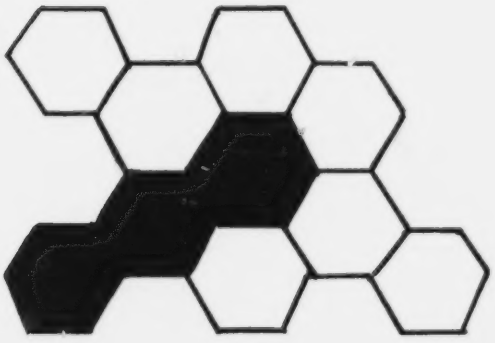
Use pages 96 or 97.

Each player chooses a different colored crayon.

Players take turns coloring in one of the hexagons.

Winner is the first player to get his color to go all the way across from one side to the opposite side.

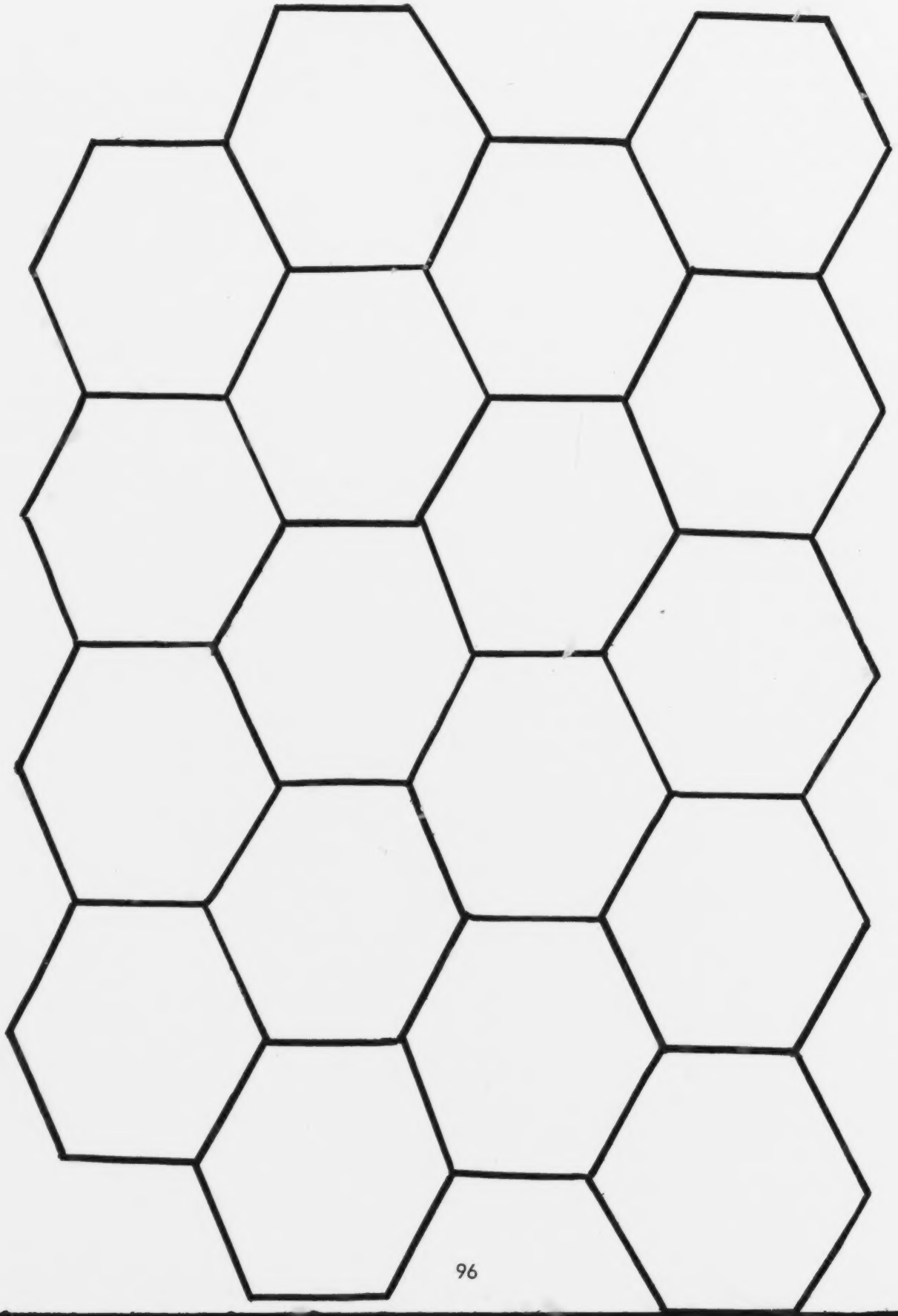
Younger children may use the larger hexagons.

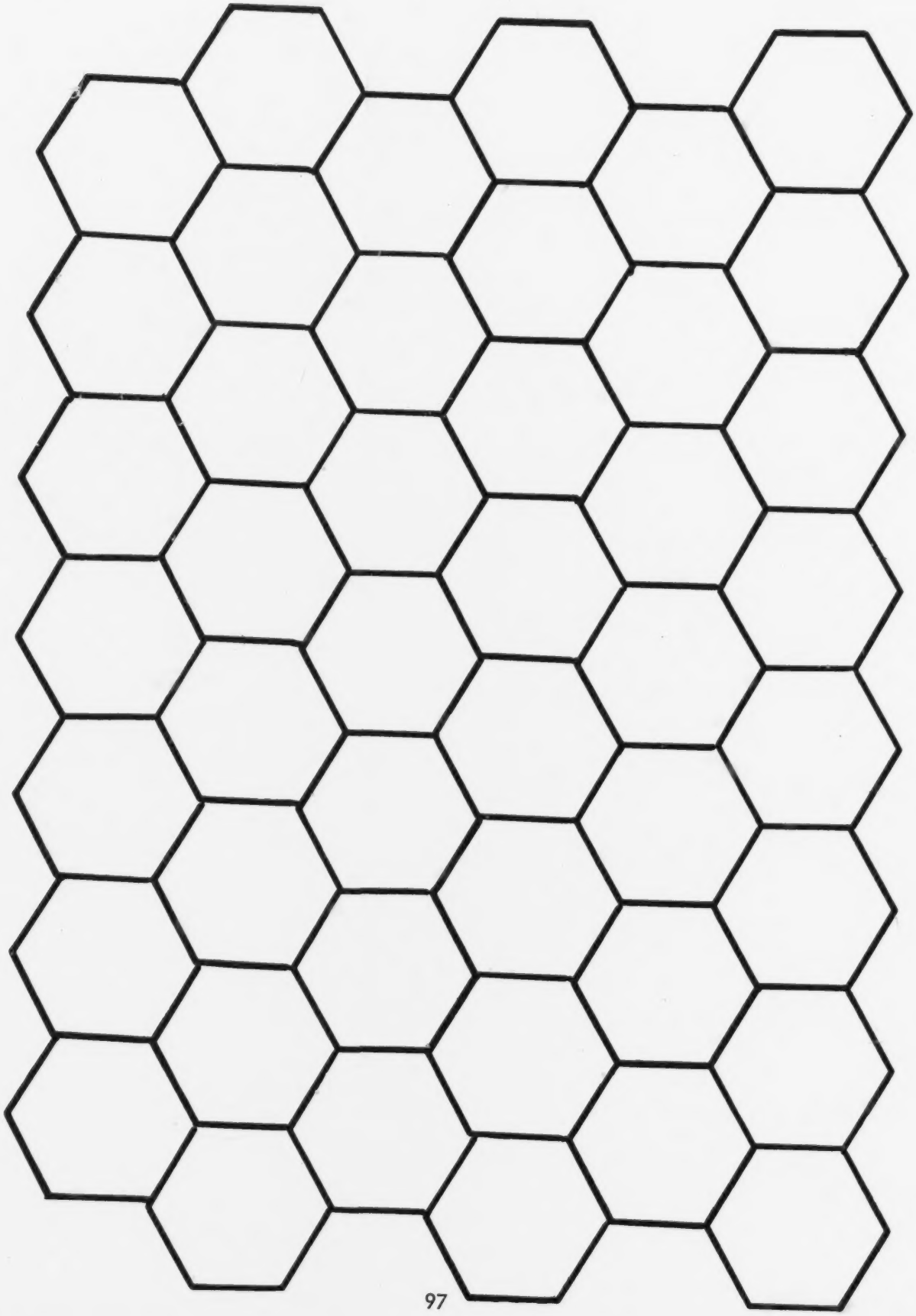


Objectives:

To build perception skills

To develop logical thinking



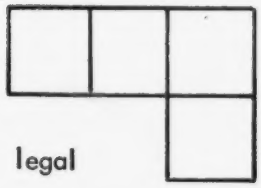


Moving Squares

Use page 93.(Squares or cubes may be used instead.)

Children cut out the squares.

Children take four squares and arrange them some way. To make an arrangement, sides must fully touch.



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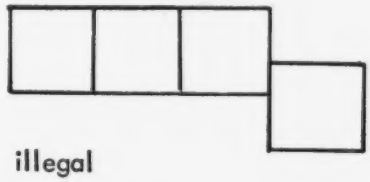

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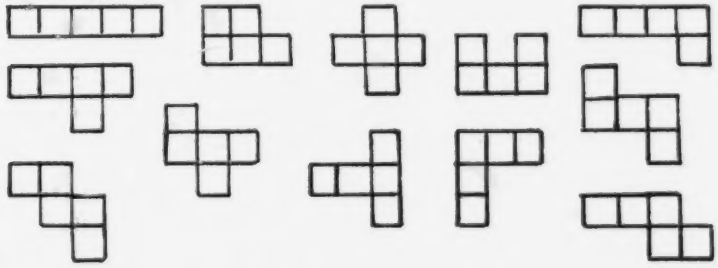
The children use the squares to make as many different arrangements as they can using four squares. An arrangement is different if it cannot be turned, rotated or flipped to look like another.

For children who complete this task quickly, let them try the above activity using five squares.



Children may trace their arrangements, cut them out, and make designs with them.

Objective:

To build perception skills

Mr. Machine

Use page 100 to make an overhead transparency.

Children try to guess what the machine does to numbers. A leader makes the machine do something different each time the game is played.

For example:

If a child puts a 1 in the machine, the machine sends out a 2. A 2 goes in, a 3 comes out. This time the machine adds one.

Another time the machine may subtract one, add two, or add zero etc.

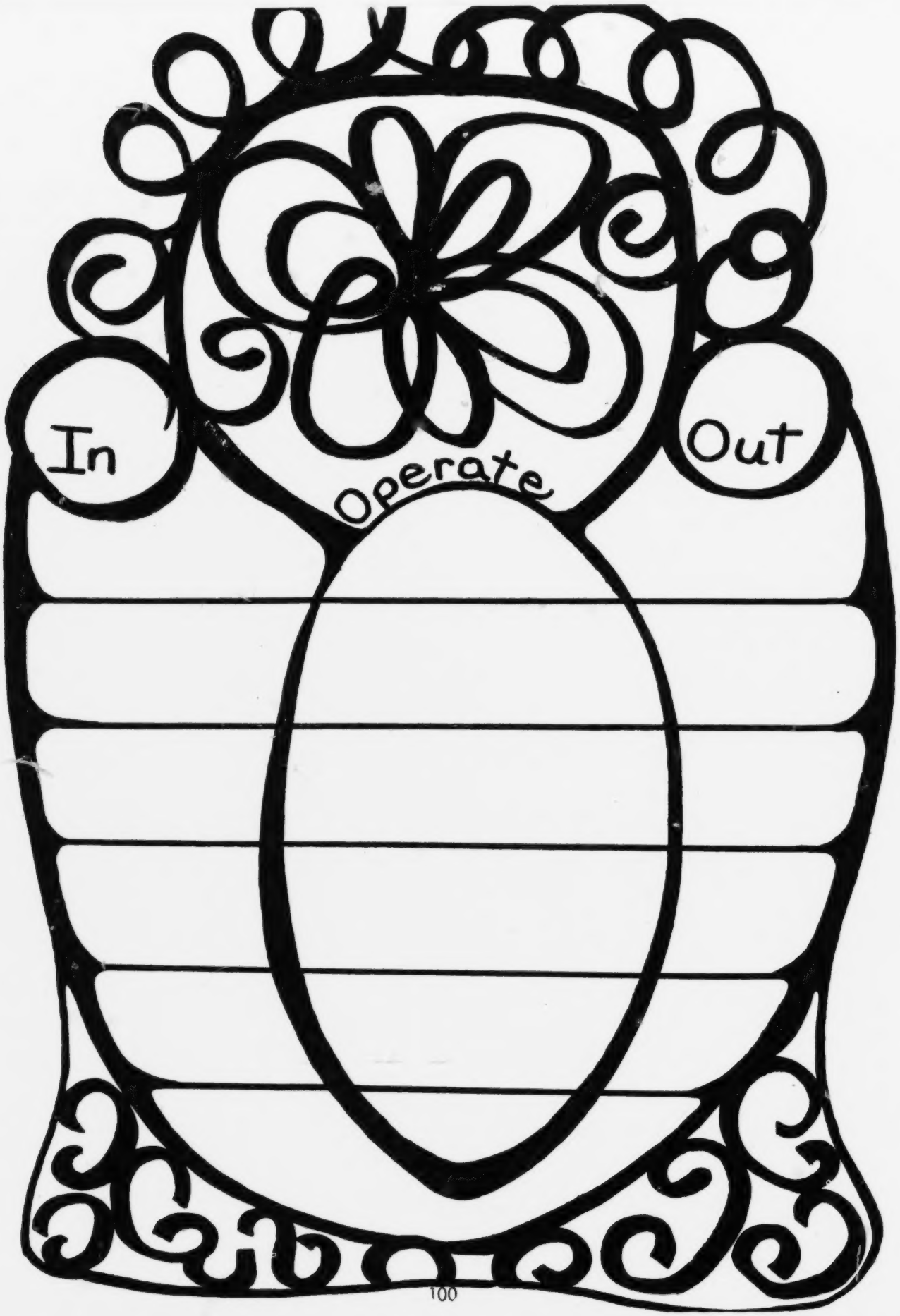
Enrichment activity:

Use the number that goes "in" with the number that comes "out" as an ordered pair and plot. (Directions on page 16.)

In	Operate	Out
1	+1	2
7	+1	8
4	+1	5
2	+1	3
5		

Objective:

To find number patterns


In
operate
Out

My Line Designs

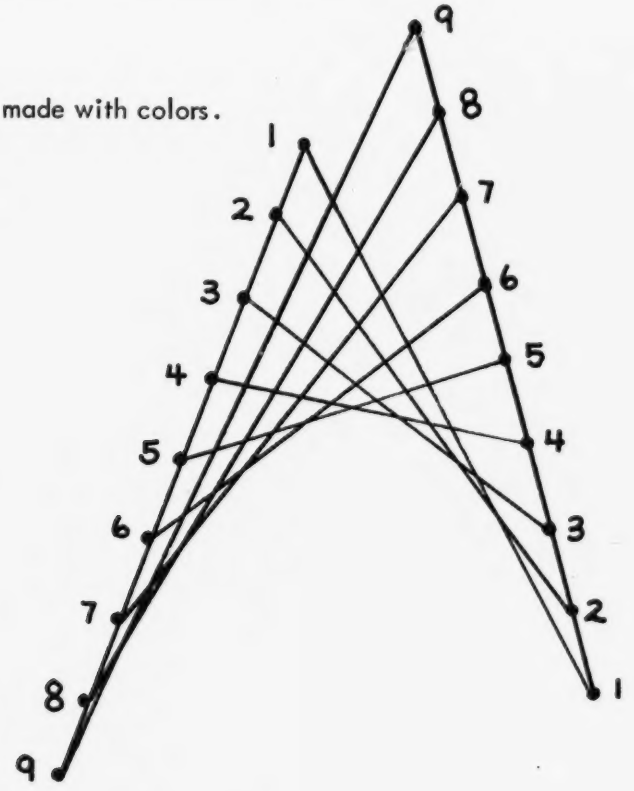
Use pages 102 to 106.

Give children a straight edge and have them connect the dots that have matching numbers.

See if they can discover what makes their designs different. Older children will want to make designs of their own.

Variation:

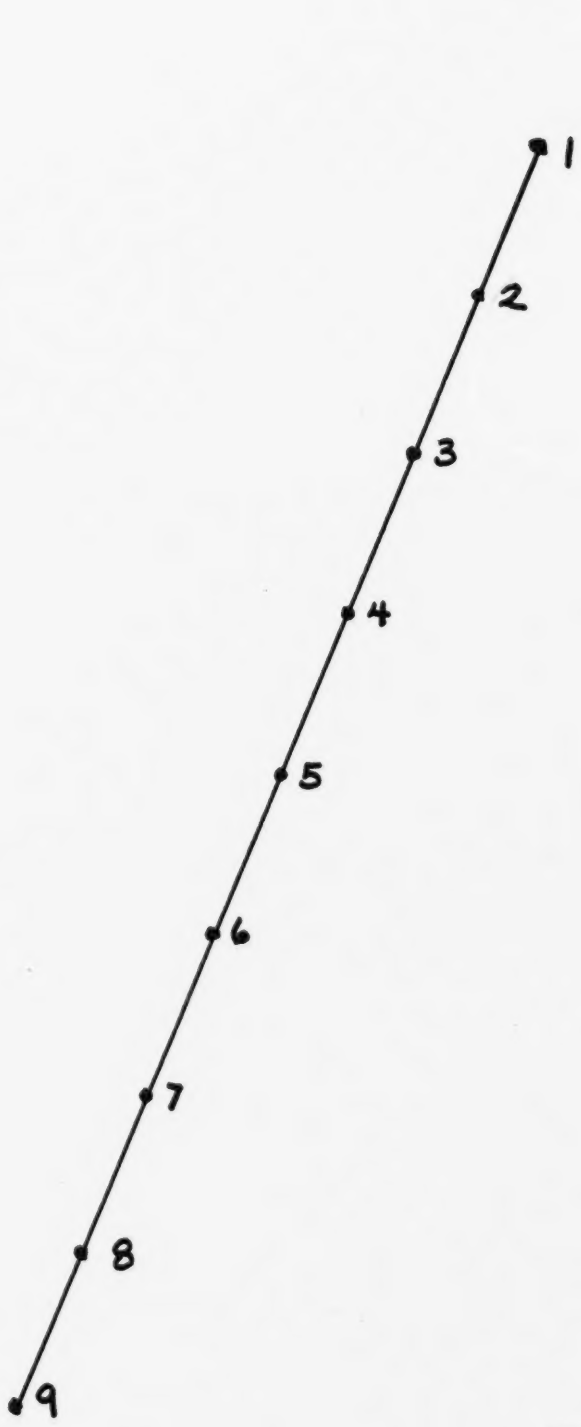
Designs may be made with colors.



Objectives:

To use a straight edge

To discover the illusion of straight lines


1
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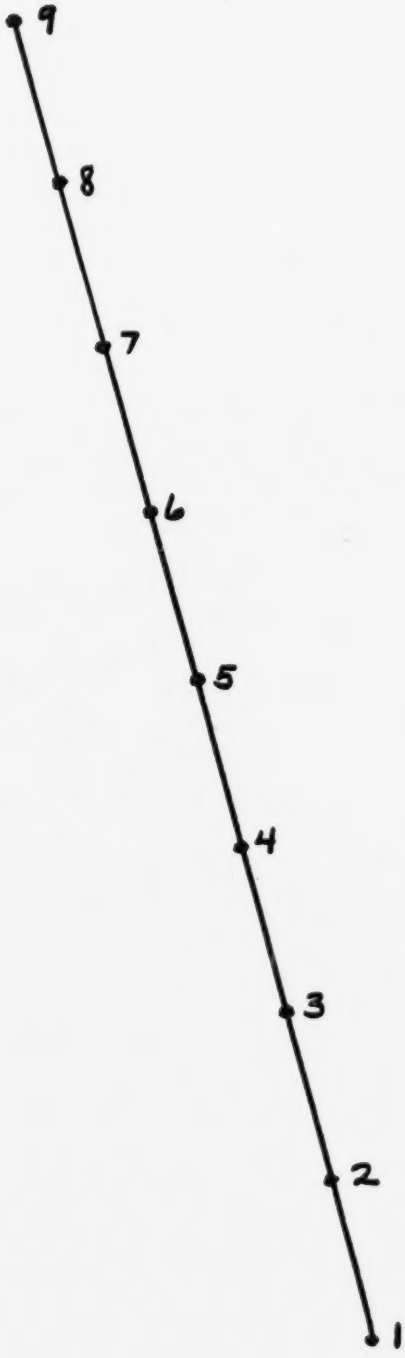
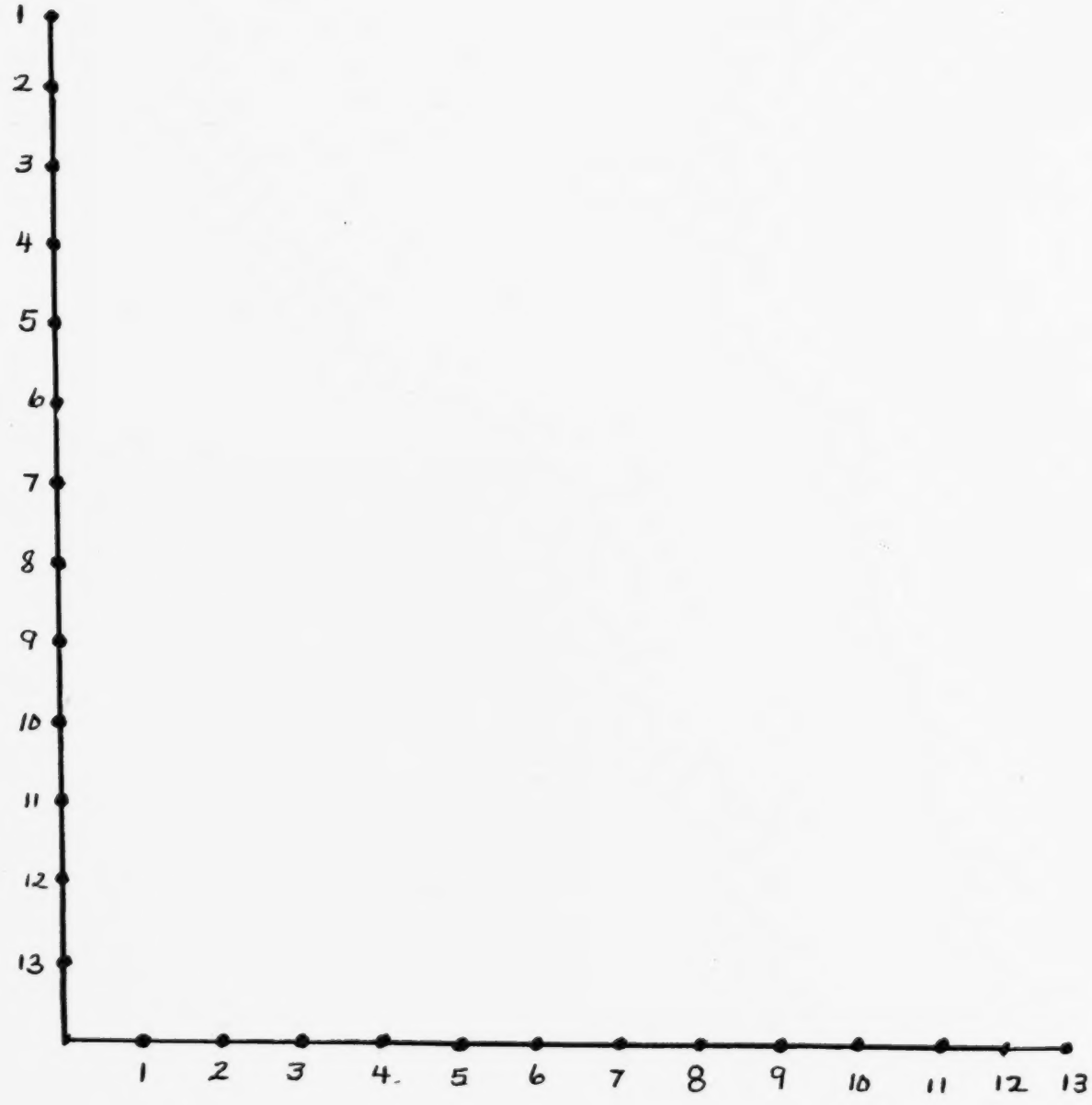

9
8
7
6
5
4
3
2
1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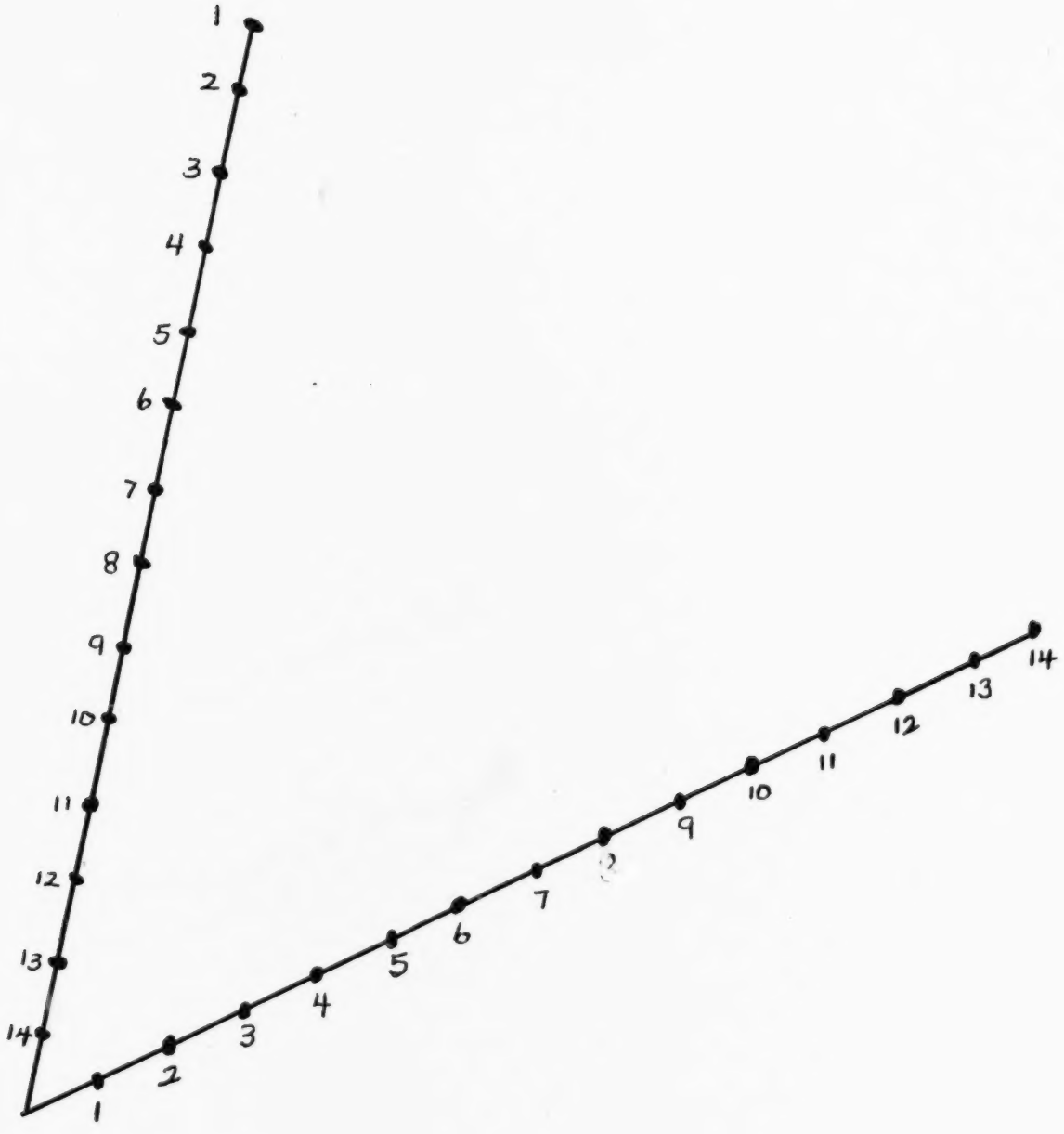
1 2 3 4 5 6 7 8 9 10 11 12 13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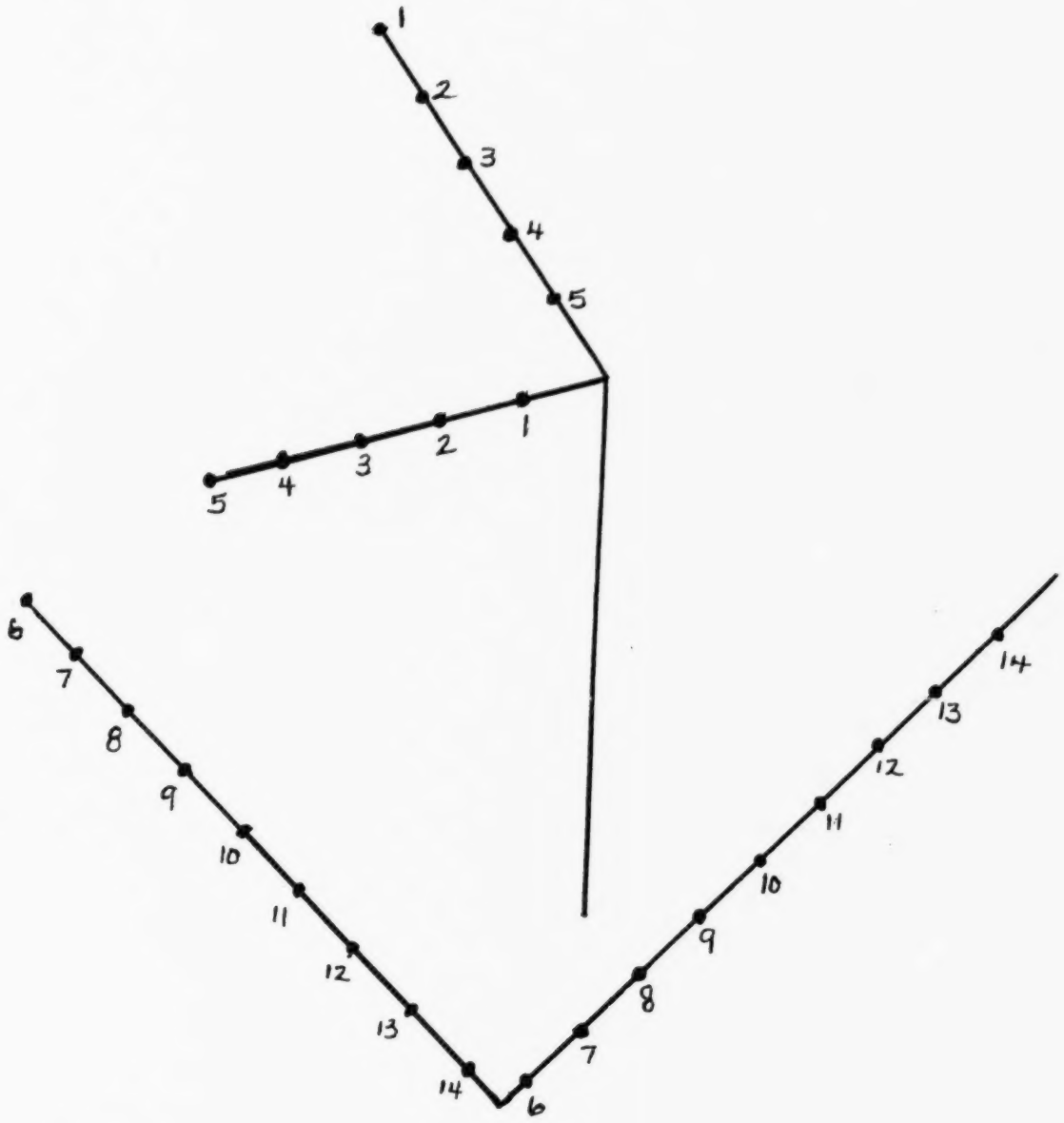
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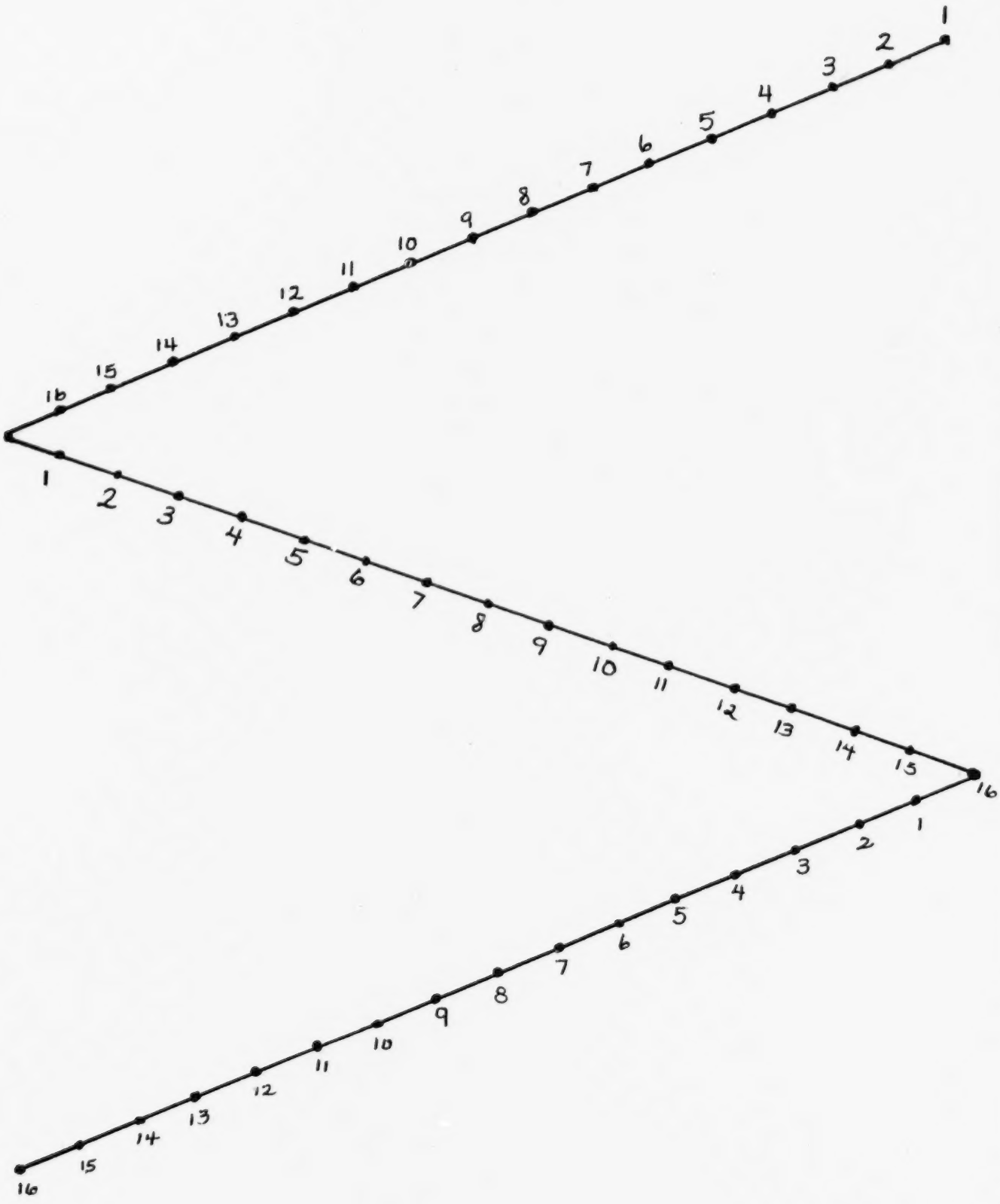
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14
15
16
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16

My Number Book

Use pages 108 to 115.

Have children find and fill in the information on these pages.

Put the pages together so that each child has his own Number Book.

Children may compare the information in their books.

Use the information to do the Picture Story activities on page 132.

Note:

For the section "School Time", have children make clock hands to illustrate the time.

Objective:

To relate numbers to the real world

My Number Book by

My name has_____letters in it.

Today's date is _____

My age is _____

My birthday is on the_____day

of _____

I have____brothers and sisters.

I have_____ grandparents.

I have_____pets.

My house number

is _____

My telephone number

is _____

My friend's telephone number

is _____

My school's telephone number

is _____

My friend's house number

is _____

I get up at____o'clock on school days.

I go to bed at____o'clock on school days.

We have____TV channels in our city.

My favorite TV show is on channel _____.

I am _____ inches tall.

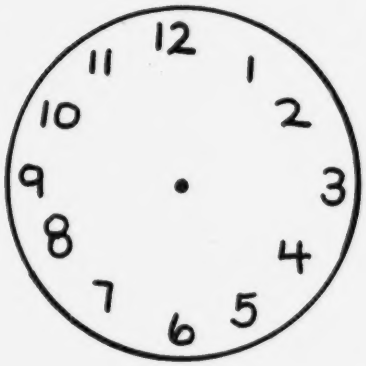
I weigh _____ pounds.

My clothes size is _____.

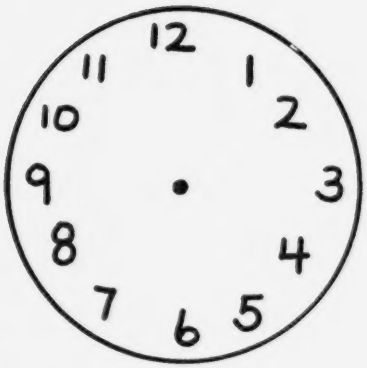
My shoe size is _____.

School Times

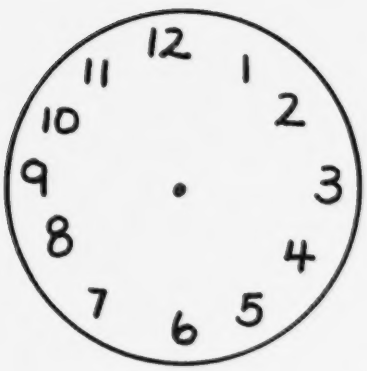
I leave for school at ____ o'clock.



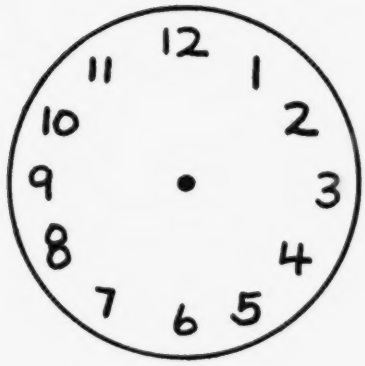
School begins at ____ o'clock.



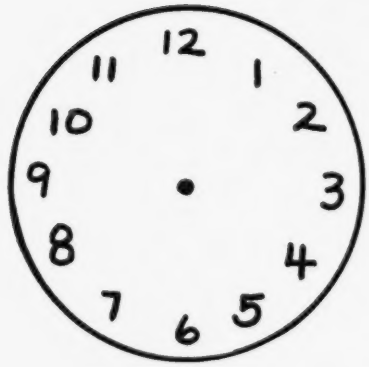
Recess is at ____ o'clock.



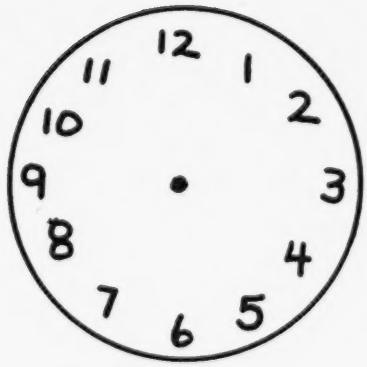
We have lunch
at _____ o'clock.



School is out
at _____ o'clock.



I get home
at _____ o'clock.



My Secret Number

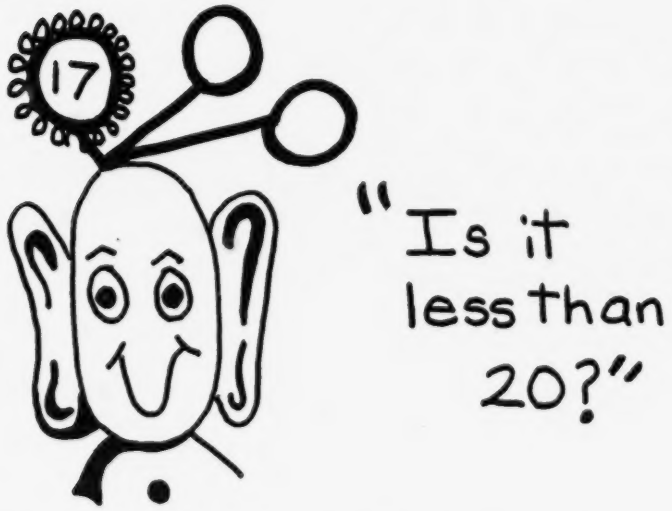
Let a child select a number between 1 and 50. He does not let the class know his number.

Children take turns asking the leader any question that can be answered by either a "yes" or a "no", i.e.:

"Is it greater than 7?"
"Is it less than 20?"

If a child says a number that is not the secret number, he is out of the game and cannot ask any more questions for that game.

The child who correctly guesses the secret number then becomes the leader for the next game.



Objectives:

To reinforce understanding of greater than and less than

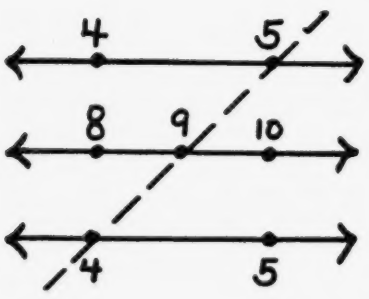
To strengthen the order relationship of numbers

Nomograph Families

Use page 118.

Have children use nomograph and straight edge to review addition and subtraction facts up to 20.

Examples:

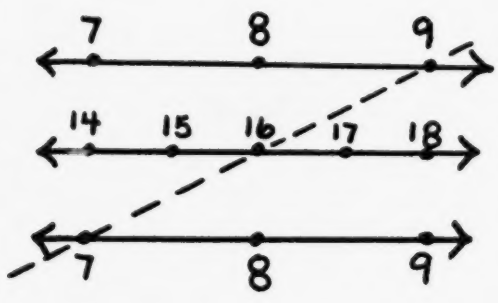


$5 + 4 = 9$

$4 + 5 = 9$

$9 - 4 = 5$

$9 - 5 = 4$



$7 + 9 = 16$

$9 + 7 = 16$

$16 - 9 = 7$

$16 - 7 = 9$

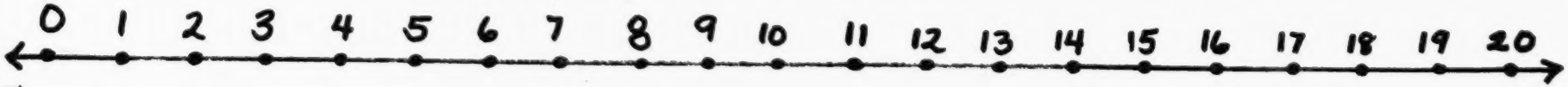
Objectives:

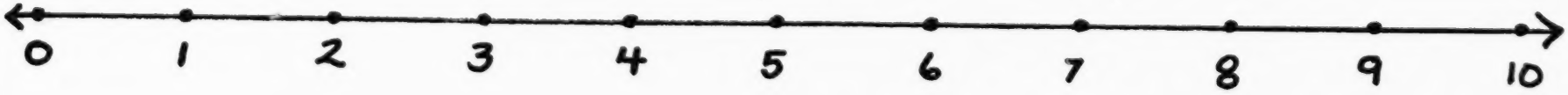
To understand relationship between addition and subtraction

To reinforce addition and subtraction facts using the number line

Nomograph

0 1 2 3 4 5 6 7 8 9 10


0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20


0 1 2 3 4 5 6 7 8 9 10

Number Relay

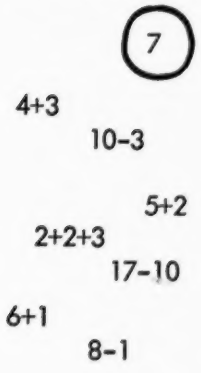
Children form teams. Teams line up facing the chalkboard and the teacher calls out a number.

Each team sends its front man up to write another name for that number. Player then goes to the back of the line.

A scorekeeper tallies the team that won. Game is over when each member has had a turn. The teacher may use the same number for the entire game, or she may want to change the number for each turn.

Winning team has the highest score.

Example:



Objectives:

To reinforce the concept that numbers have many names

Order of Symmetry

Cut out the shapes on page 121.

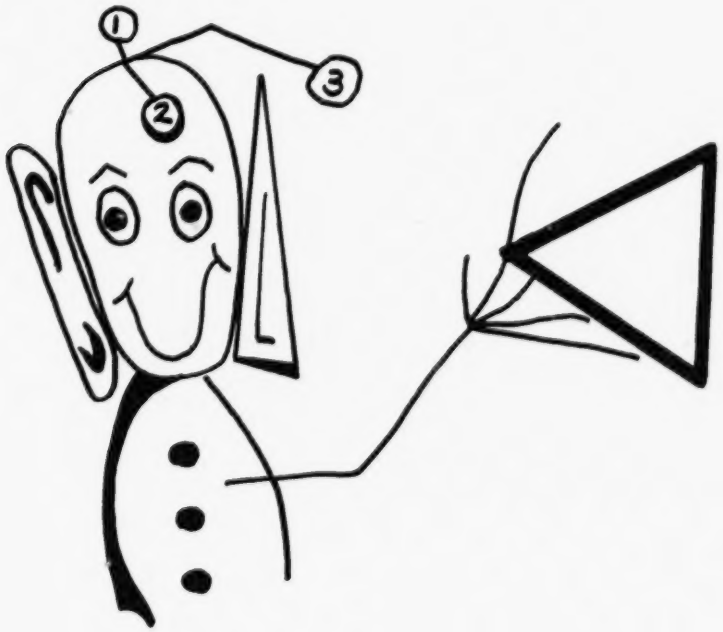
Have children choose a shape and trace its outline.

Let them turn their shape around or over, and have them find out in how many positions the shape fits into its own outline.

This is called the Order of Symmetry.

Have them find out the Order of Symmetry for each shape.

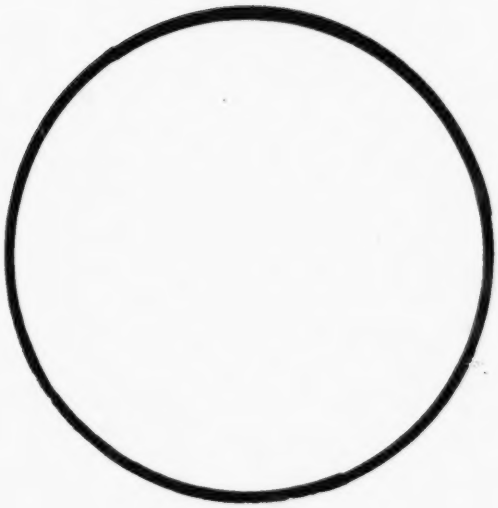
Let them discover how a circle differs from the other shapes.

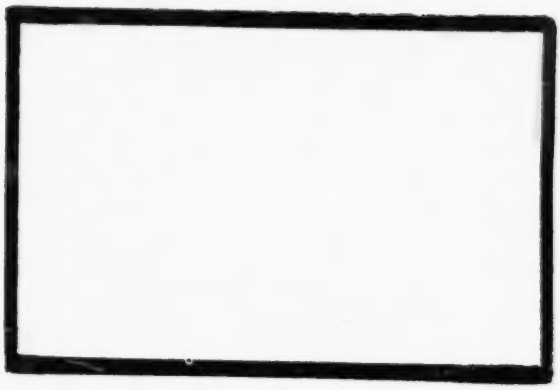


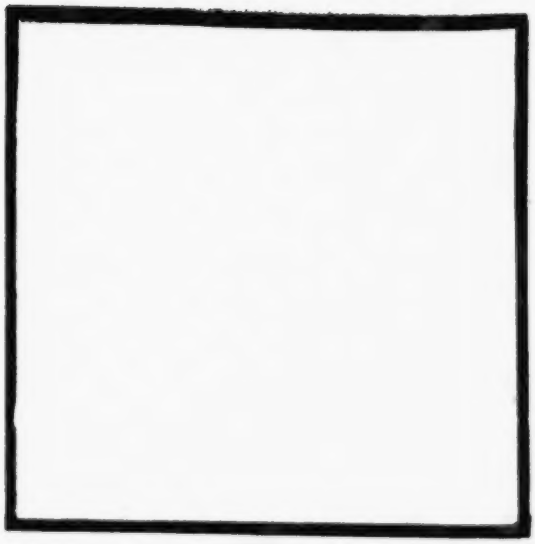
Objectives:

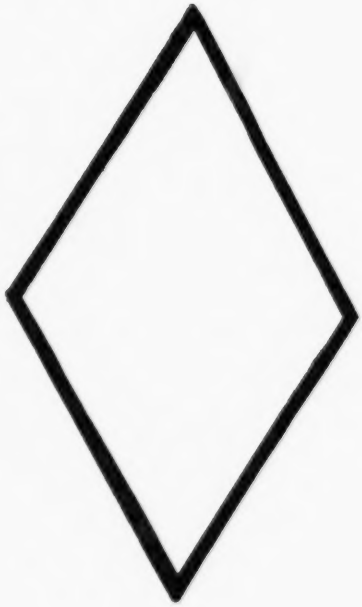
To introduce symmetry

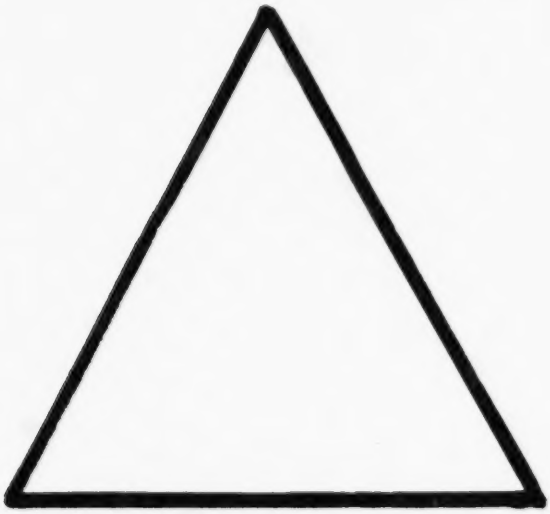
To provide an example of infinity

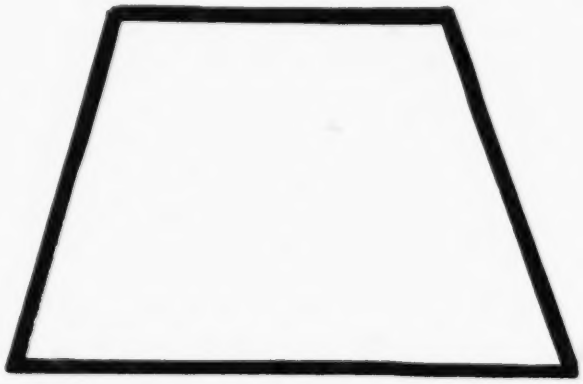












Paper Cup Toss

Use page 123.

A game for two or more players.

Materials: One paper cup for each group.

Players take turns tossing the cup into the air and letting it land.

If it lands on its side, player gets 1 point.
If it lands on the top, player gets 2 points.
If it lands on the bottom, player gets 3 points.

Player records his score for each turn.

When each player has had 5 turns, players add their scores.
Winner is the player with the highest score.

Variation:

Toss coins, giving heads one point and tails two points.

Objective:

To provide background for understanding probability

Score

1 _____

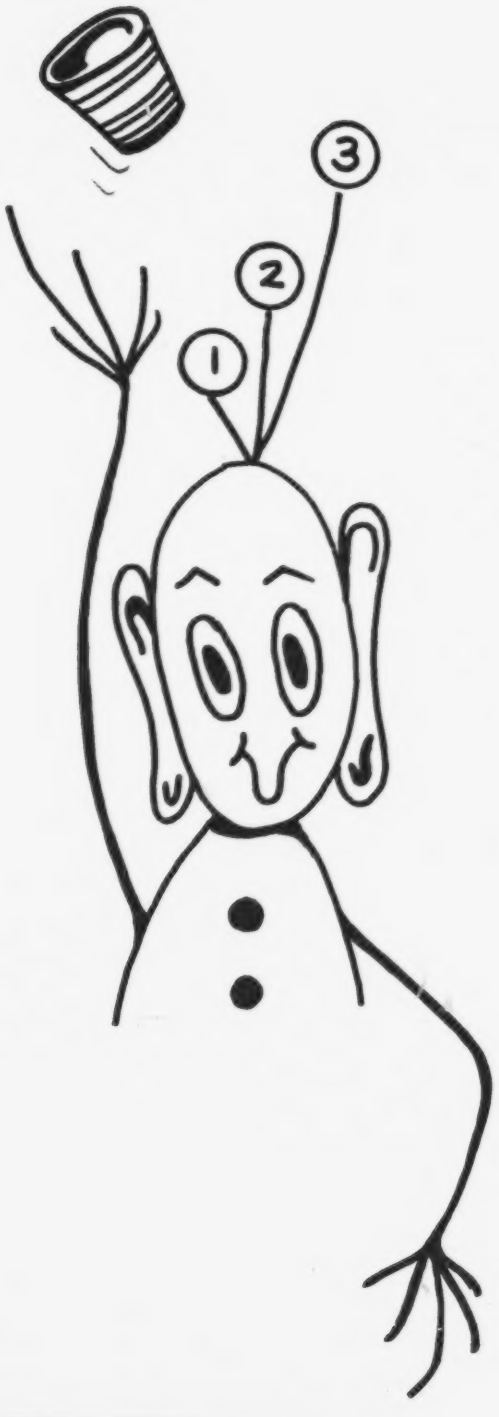
2 _____

3 _____

4 _____

5 _____

Total _____



Park the Cars

Use pages 125 and 126.

The garages show numbered spaces.

Page 125 has rows of numbered cars.

Children color cars, cut them out and paste them in proper garages.

Variation:

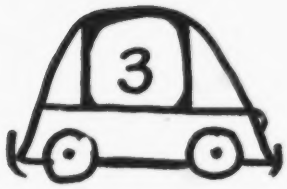
Cars and garages are cut out, matched, and lined up in counting order.

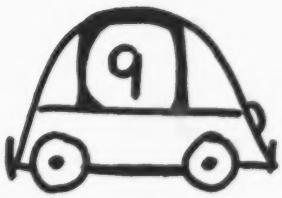
Objective:

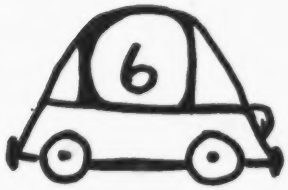
To build skills in recognizing and matching cardinal numbers

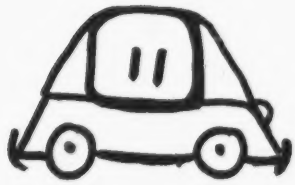
7

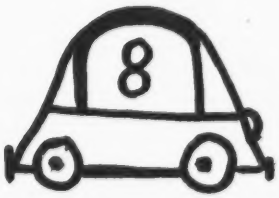
12

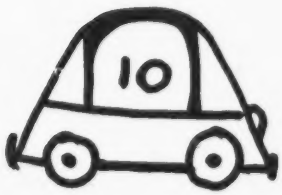

3


9


6


11

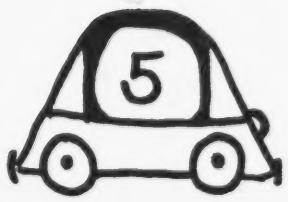

8

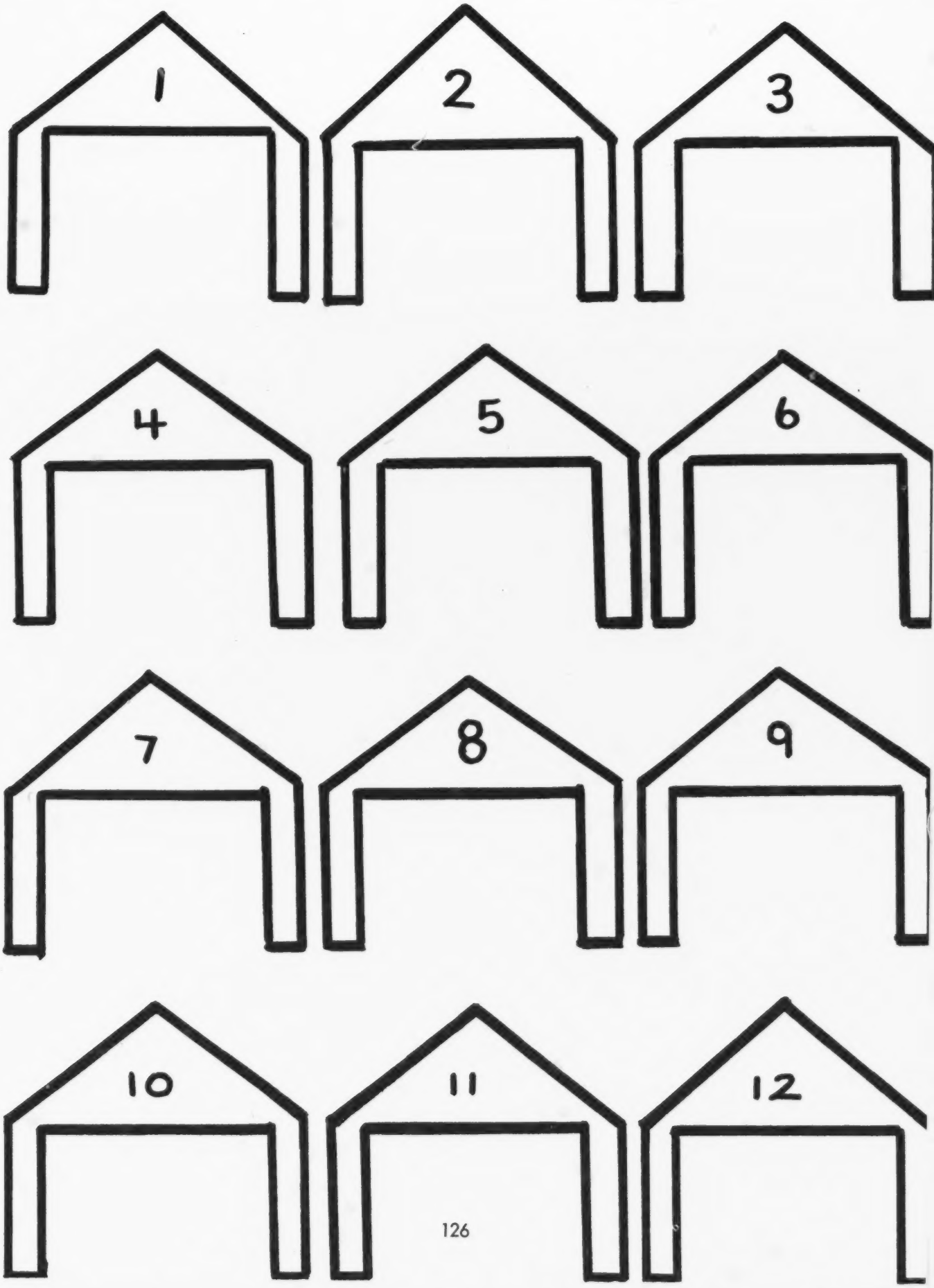

10

4

2

1


5


1
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12

Penny Toss

An experiment for small groups of children.

Have the group make 100 tosses of a penny and record whether each toss is a head or a tail.

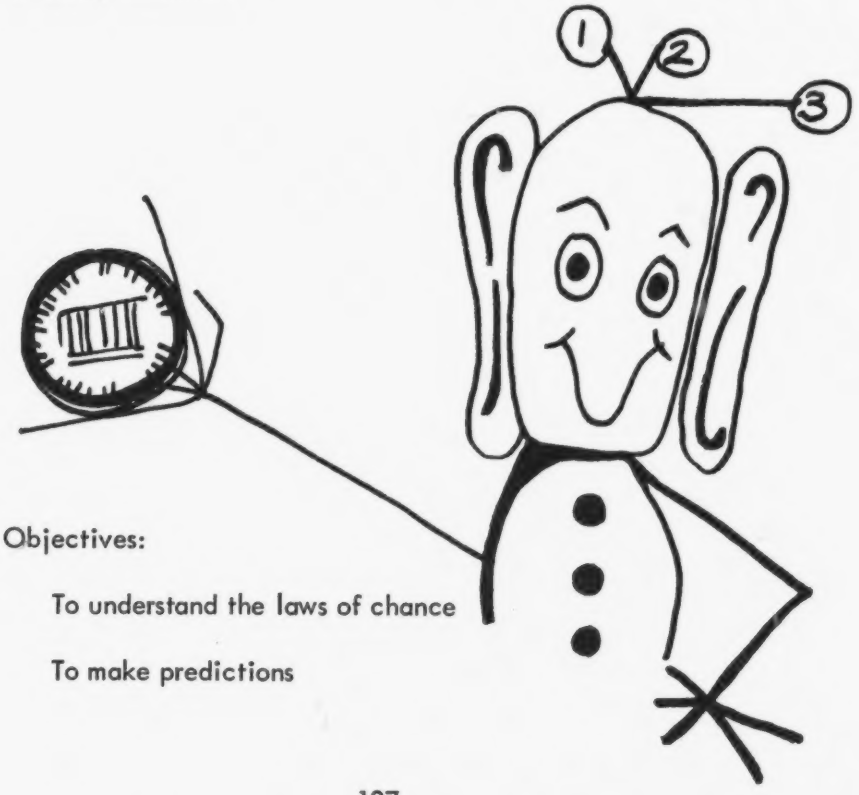
Have children observe which comes up the most. Let them predict the outcomes for the next few tosses.

Bring up the question, "What are the chances of a toss being a head?" Discuss 50%, 1/2, or the chances are even.

Relate the understanding of making predictions to real life situations:

1- Weather: There is a greater chance of rain if the sky is cloudy.

2- Predict chances of getting a prize in the gum ball or candy machine.



Objectives:

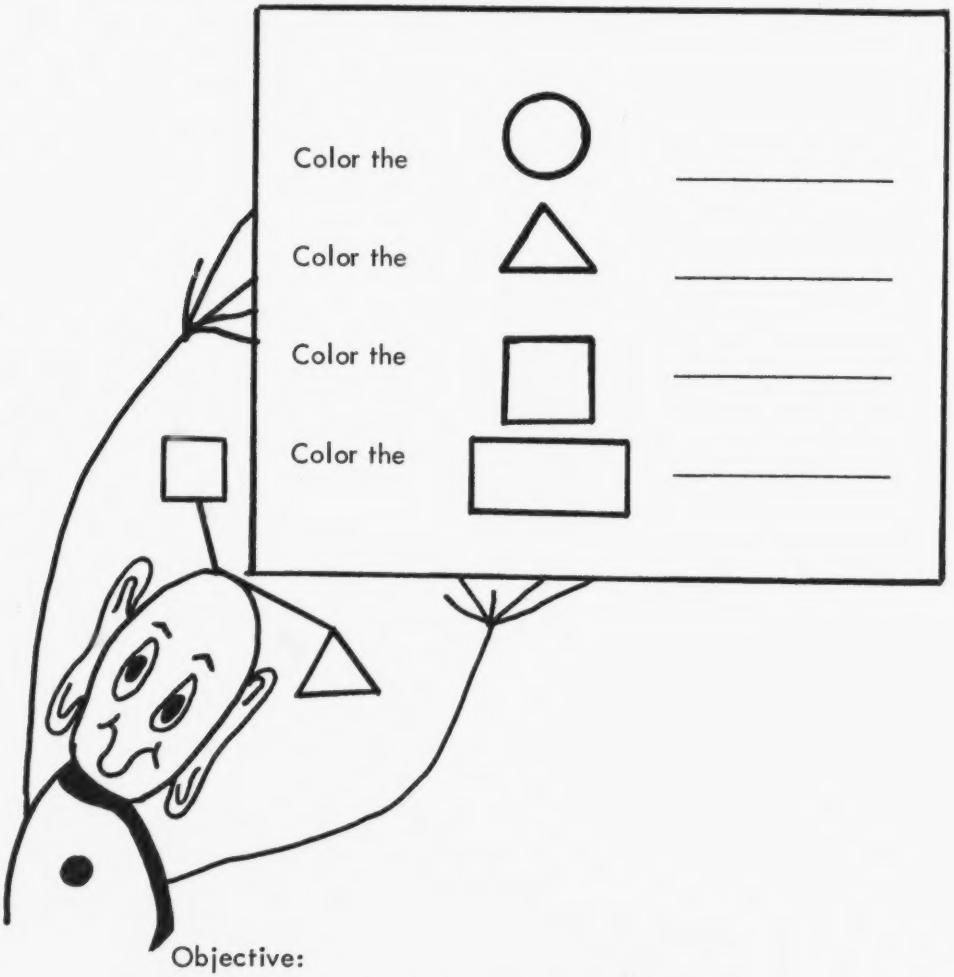
To understand the laws of chance

To make predictions

Picture Shapes

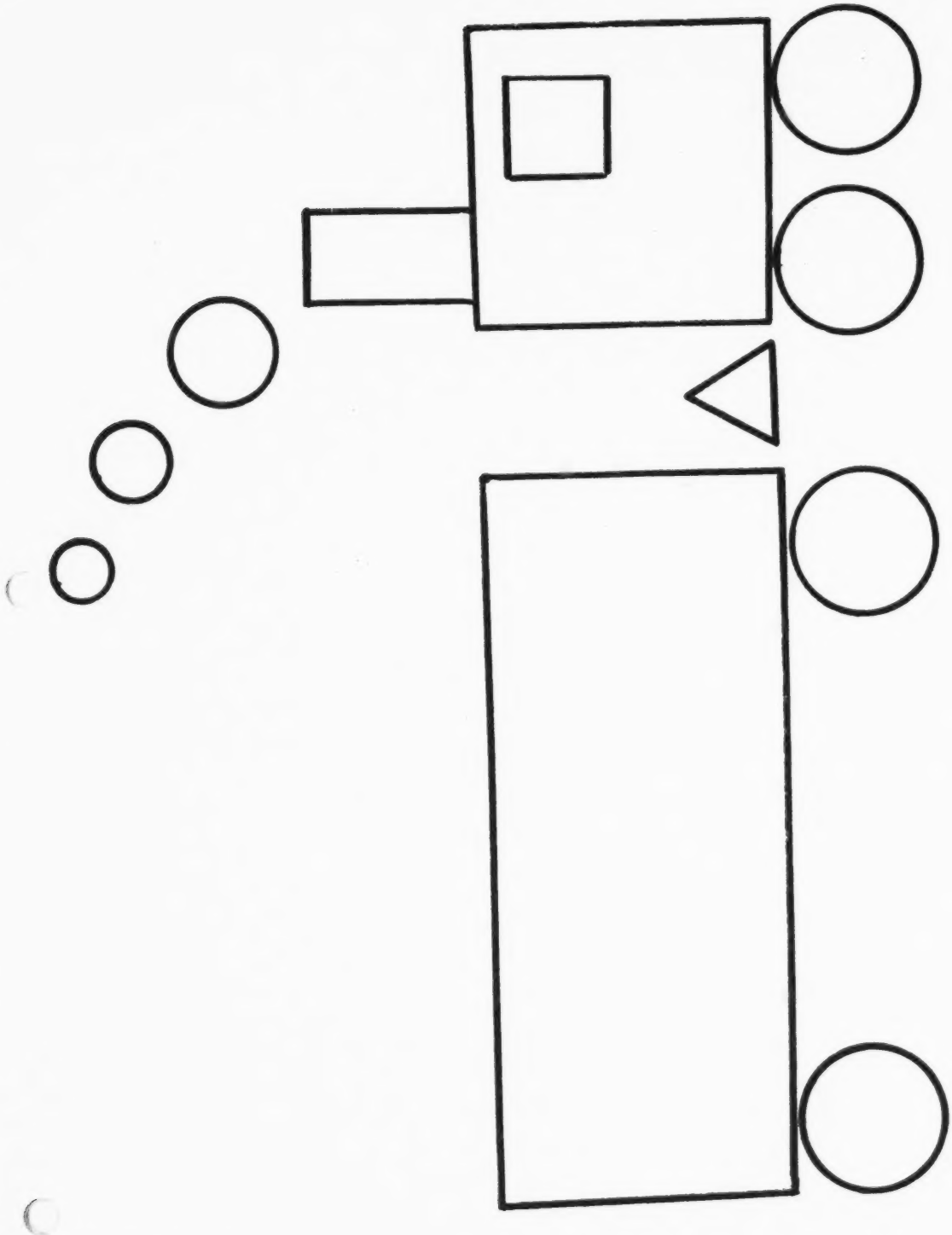
Use pages 129 to 131.

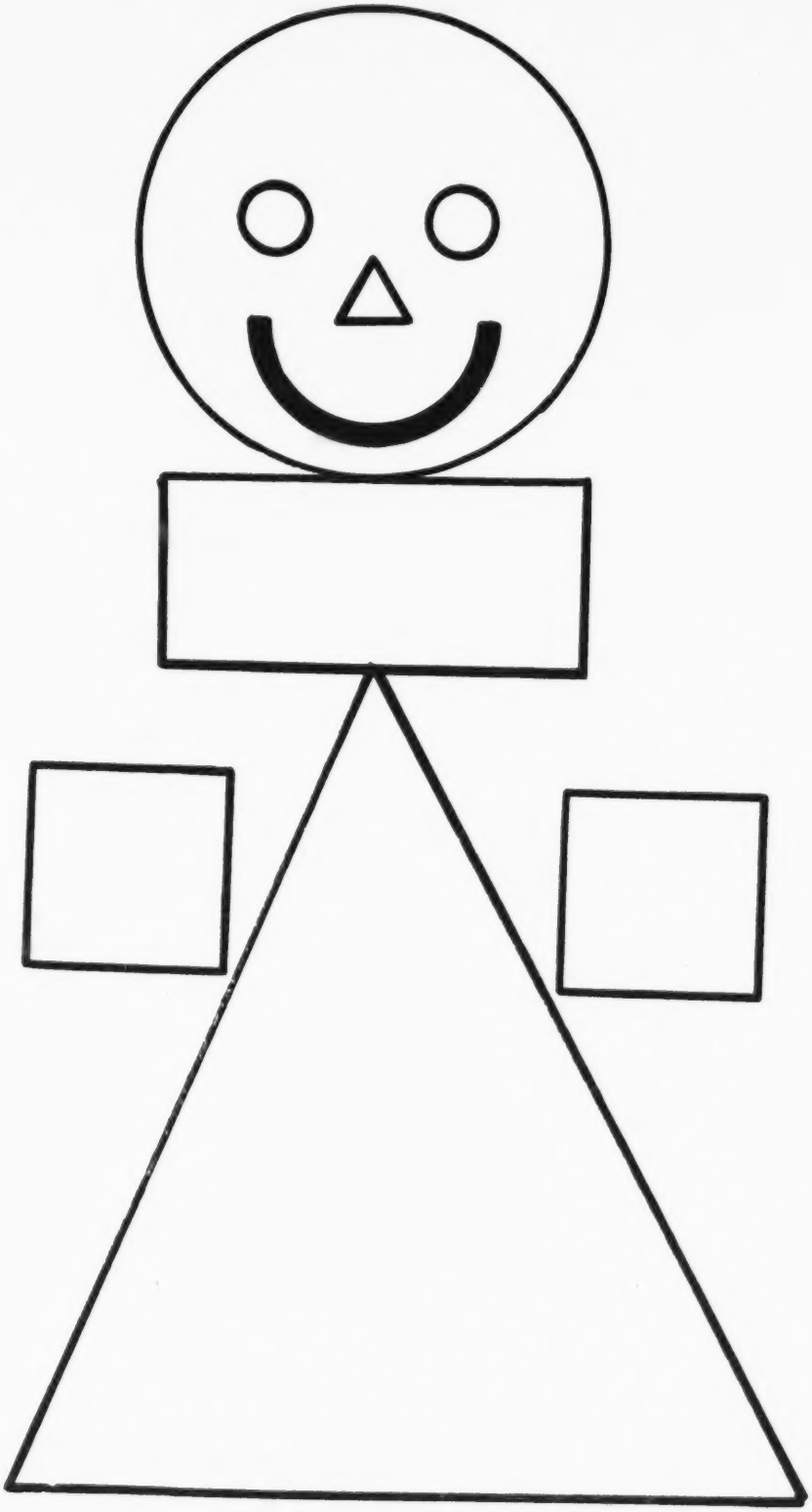
Write directions for children on chalkboard or on large tag, choosing different colors each time.

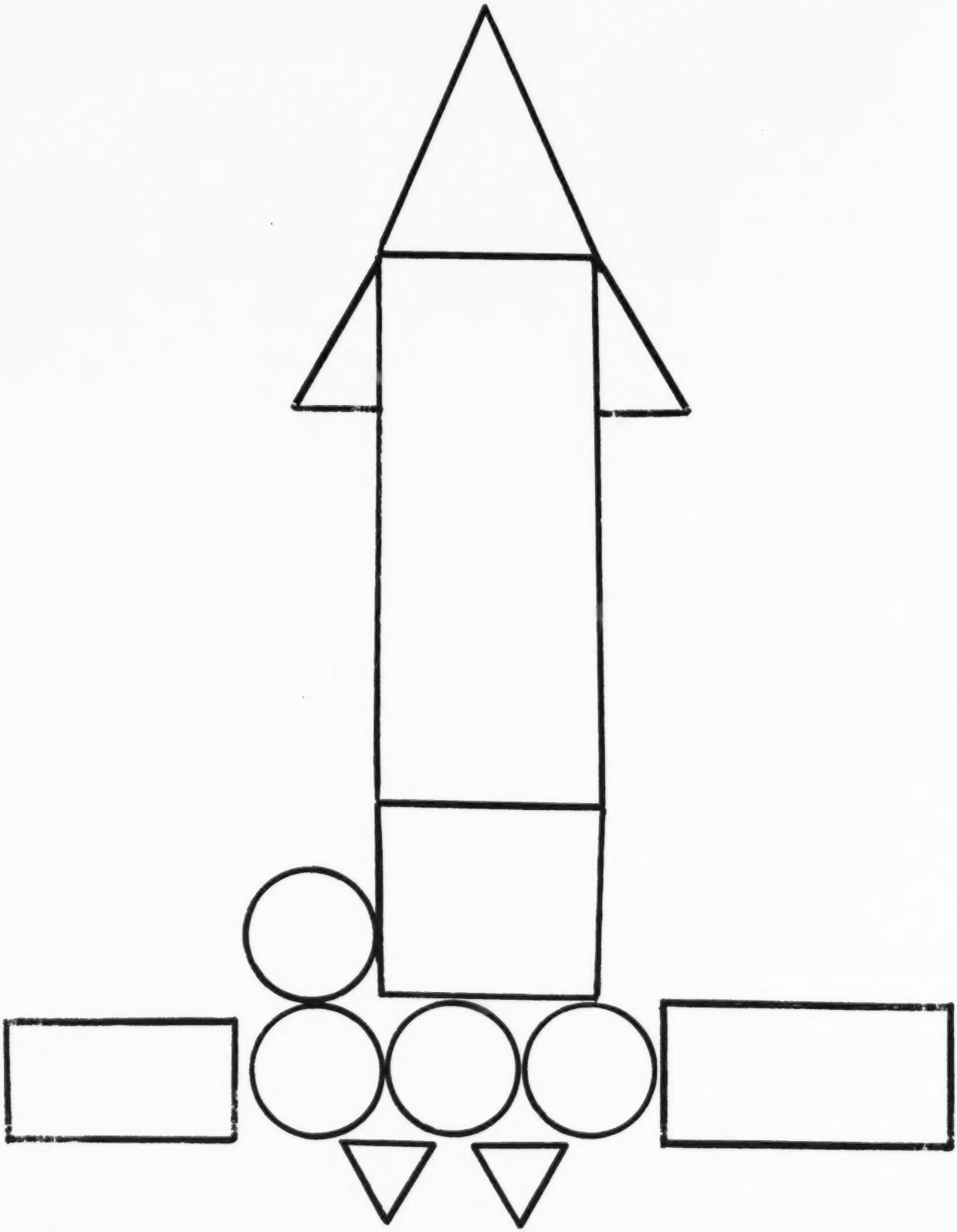


Objective:

To recognize geometric shapes







Picture Stories

A graph is a picture that gives information.

Have each child make a picture of his favorite animal. 5 1/2 x 8 1/2 paper is suggested.

Use a large piece of butcher paper and paste all the dogs in one row, cats in another, monkeys in another, etc.

Have children interpret the graph they have just made by discussing such questions as:

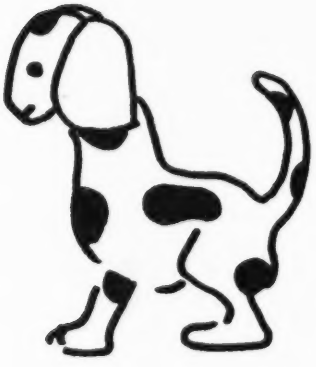
Which animal is the favorite?

Which animal is the second favorite?

How many more of one kind than another?

How many kinds of animals are there on the graph?

What are some of the animals not included?



Other suggested graph topics:

Favorite:

T.V. Show
Cereal
Dessert
Holiday
Toy
Game
Sandwich
Story
Color

Number of:

Brothers and sisters
Blocks I walk to school
Letters in my name
Pets in my family

Birthdays in our room

Our heights

Color of our eyes

Our shoe sizes

The list is inexhaustible and the graphs should be as innovative and creative as the teacher and the children can make them. Always include much interpretation.

Objectives:

To help children see relationships

To read and interpret bar graphs

Rescue the Princess

Use page 135 for the game board.

Use page 136 to make spinner and markers. Color if desired.

Players take turns spinning for a number and move that many spaces.

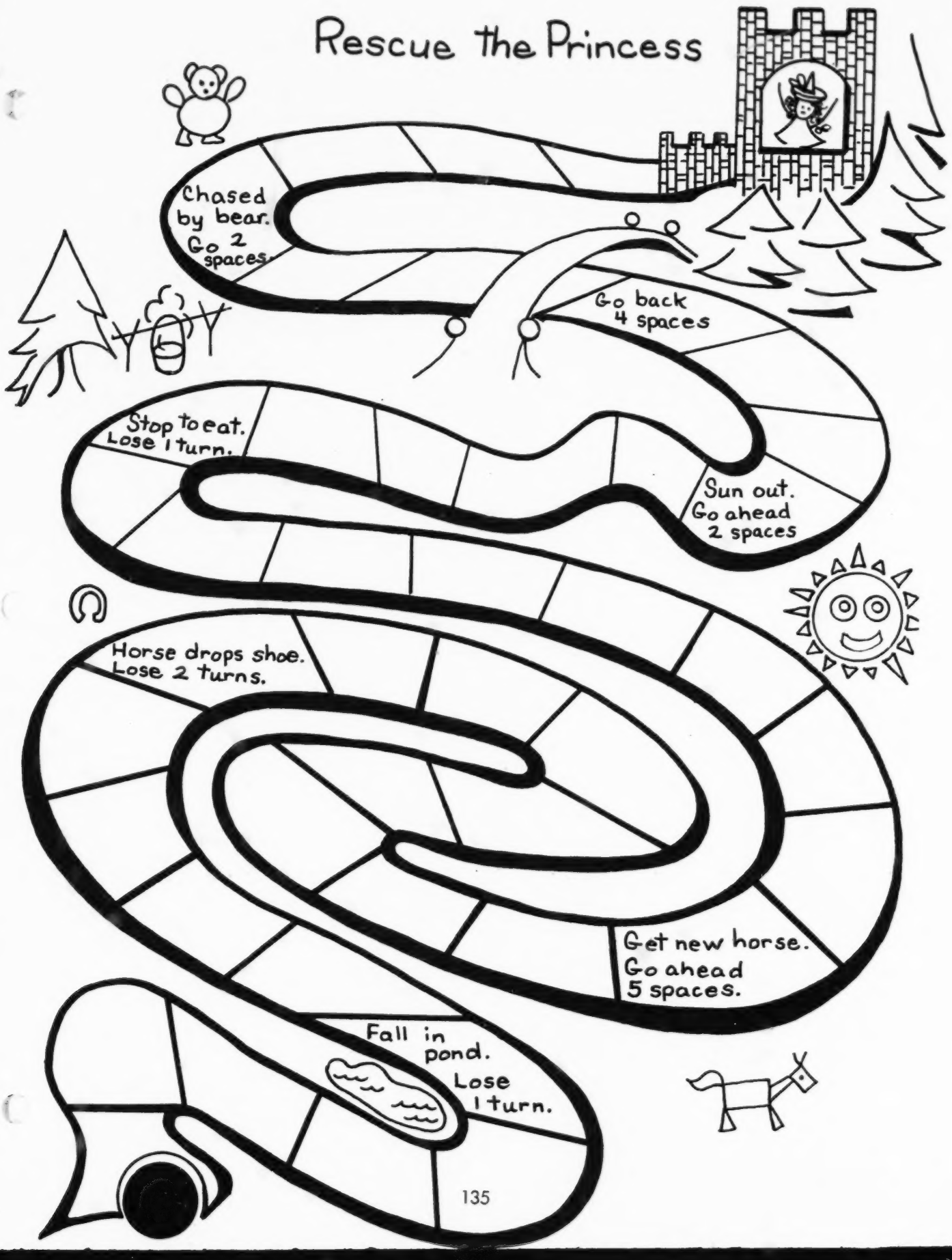
Children follow directions found in spaces when they land on them.

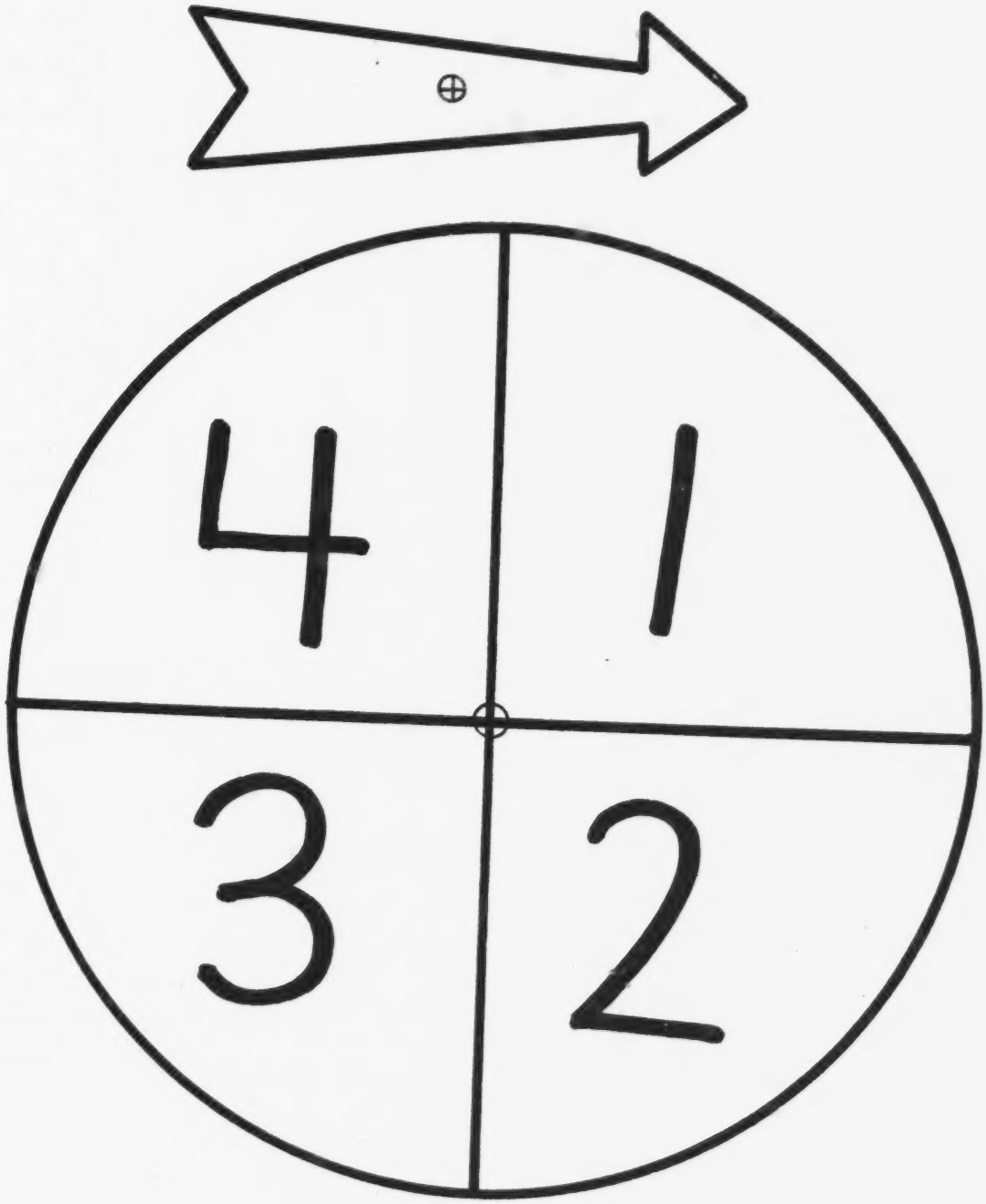
Winner is the first player to reach the princess.

Objective:

To use the counting order of numbers

Rescue the Princess


Chased by bear. Go 2 spaces.
Go back 4 spaces
Stop to eat. Lose 1 turn.
Sun out. Go ahead 2 spaces
Horse drops shoe. Lose 2 turns.
Get new horse. Go ahead 5 spaces.
Fall in pond. Lose 1 turn.


4
1
3
2

Roman Addition

Teacher writes Roman numerals in empty egg carton sections.

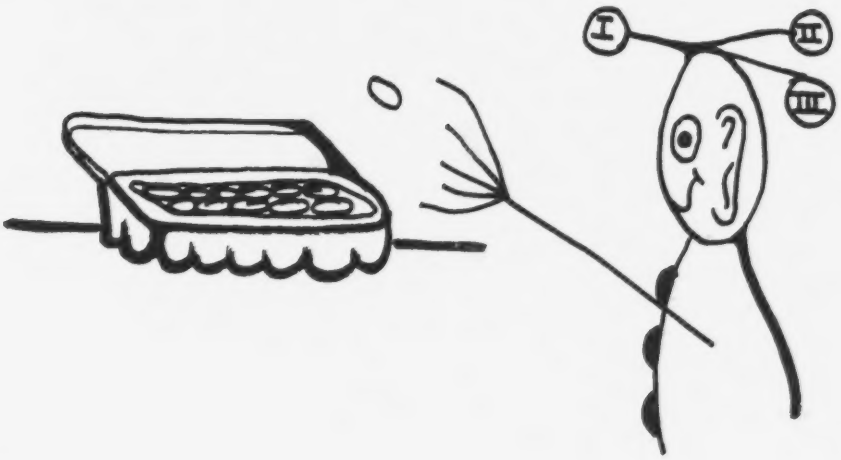
Children take turns standing on designated line and tossing "lagger" into egg carton sections.

Each child has 3 turns. Score keeper records each score. Child returns to seat and adds his total score.

Highest score wins.

Variation:

Game may be played as relay with two teams.



Objectives:

To recognize Roman numerals

To build addition skills

Roman Mod 12

Game for 2 or more players.

Use page 139 to make a spinner, and page 140 to keep score.

Each player has a marker placed on "Start".

Player spins and moves his marker clockwise the number of spaces shown on the spinner. Player then records the number he lands on as his score for that spin.

The player leaves his marker there and that becomes his starting position for the next turn.

Players add their scores after five spins each, and the winner is the one with the highest score.

Variations:

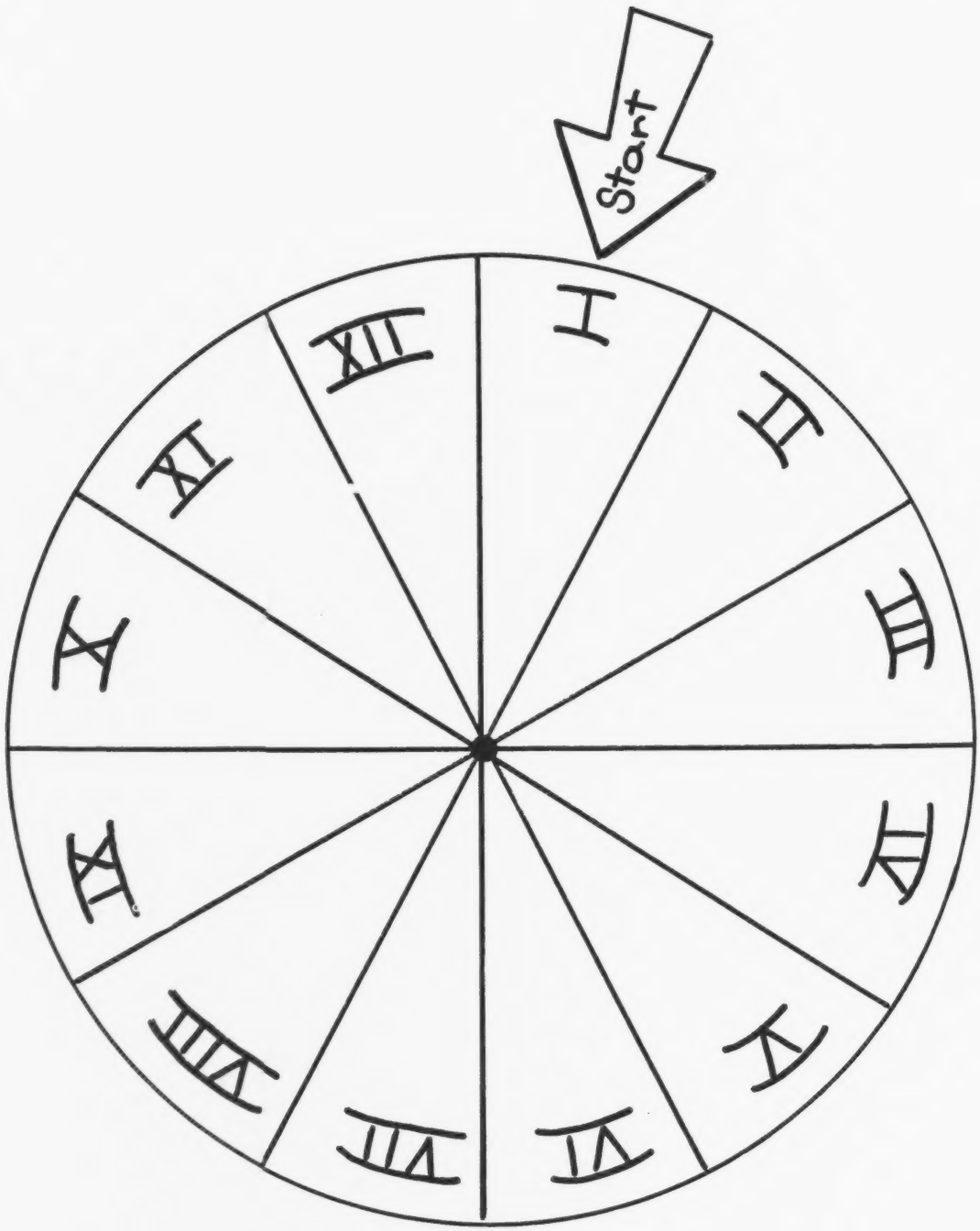
Winner is the player whose last turn lands him on the space with the highest number.

Winner is the player with the lowest score.

Objective:

To use Roman numerals

To use a finite number system


Start
I
II
III
IV
V
VI
VII
VIII
IX
X
XI
XII

Score

1 _____

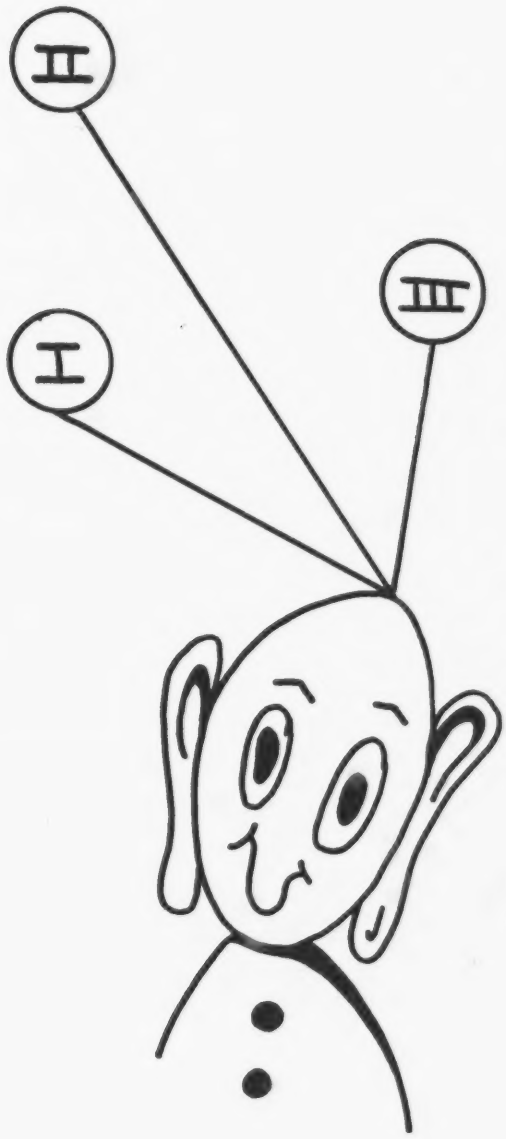
2 _____

3 _____

4 _____

5 _____

Total _____



Scamper

Children form a circle with one child in the center. Children in the circle number off.

The game begins as the teacher calls two numbers. The children who represent those numbers try to change places before the center child takes one of their places. The center child takes the number of the child in the circle he replaces, and that child goes to the center.

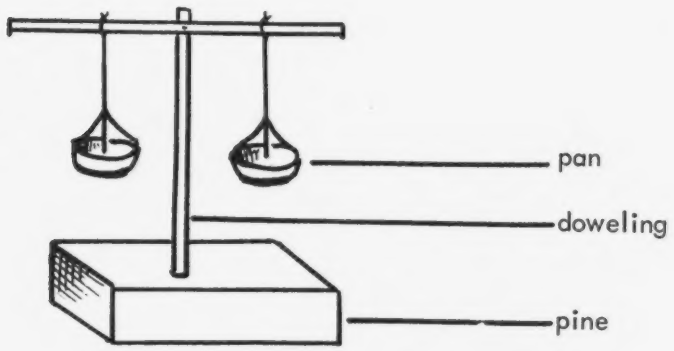
Objectives:

To build listening skills

To reinforce number recognition

See-Saw Activities

Supply an equal arm pan balance either commercial or teacher made.



Ask the children what makes a see-saw balance. (Equal weight on both sides.)

1- Show them two objects and ask if they think they would weigh the same, or if one is heavier than the other. Children may feel the objects. Let them test their predictions by placing each object in one of the pans.

2- Give them various objects to put in the pan balance so they can find out which are heavier, which are lighter, and what relationships the objects have to each other.

Examples:

Let them find two things they think will balance and try them.

Find out how many small balls will balance a large ball.

Place a wet sponge and a dry sponge on the balance to see which is heavier.

See what happens to the wet sponge as it dries.

Find out how many cups of rice it takes to balance a cup of beans.

Fill one cup with macaroni and one cup with nuts. Count which has the most objects, then discover which weighs the most.

Count how many paper clips it takes to balance an eraser, pencil, etc.

Weigh various size rocks, boxes, empty plastic bottles etc.

Variation:

Provide tasks on job cards for independent activities.

Extended Activity:

Set up in math lab as a unit on measurement.

Objectives:

To understand weight relationships

To gain skill in estimating weight

Shape Clues

A group or class activity.

Use page 121.

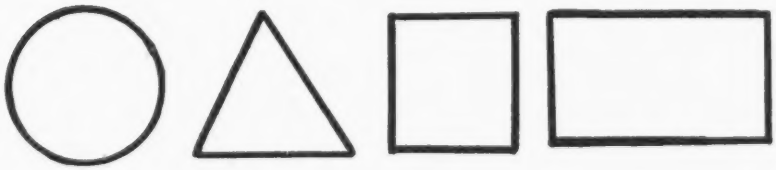
Place shapes in a covered box. A leader selects one shape from the box and hides it from the group.

The leader gives one clue as to the shape he has hidden. If the shape is not identified, the leader gives a 2nd clue, then a 3rd clue, 4th clue etc. until the shape is identified. Clues must be accurate and appropriate. The leader tries to stay up as long as possible and gives only one detail for each clue. Child who guesses the shape is the next leader.

Winner of the day is the leader who was able to give the most clues.

Example:

It has many sides.
It has many angles.
It has the same number of sides as it has angles.
All the angles are the same size.
It has four sides.
Two sides are longer than the other two sides.
(rectangle)



Objectives:

To recognize the attributes of geometric shapes

To describe a geometric shape in detail

Six High

Use page 146.

Two or more children may play.

Player tosses 2 dice and writes the larger number in the tens column and the smaller number in the ones column.

Children take turns for any pre-determined number of turns. When the game is over, children add their scores.

Child with largest score wins.

Example:

	First Player		Second Player	
	tens	ones	tens	ones
1st toss	4	2	1	1
2nd toss	3	1	6	3
3rd toss	5	4	5	2
	Total 127		Total 126	

Objective:

To understand place value

To reinforce addition facts

Score for Six High

Game 1	
tens	ones
Total	

Game 2	
tens	ones
Total	

Tangrams

Use pages 149 to 156.

Tangrams are a classic. No one knows how long they have been around but they have fascinated children and adults for years.

The story is told that many many years ago Tan, a poor Chinese boy, was delivering a valuable piece of square tile to his emperor. On the way he dropped it.

It broke into the seven pieces known as the Tangram.

While Tan was trying to put it back into its original shape, he discovered that he could make all kinds of interesting designs and shapes with these seven pieces. Children ever since have found hours of enjoyment using Tangrams.

Have the children cut out the original Tangram pieces from page 149 and use them to make the shapes and designs on pages 150 to 156.

Some children will want to make designs of their own, trace them and trade with a friend.

Younger children will use fewer pieces to make designs.

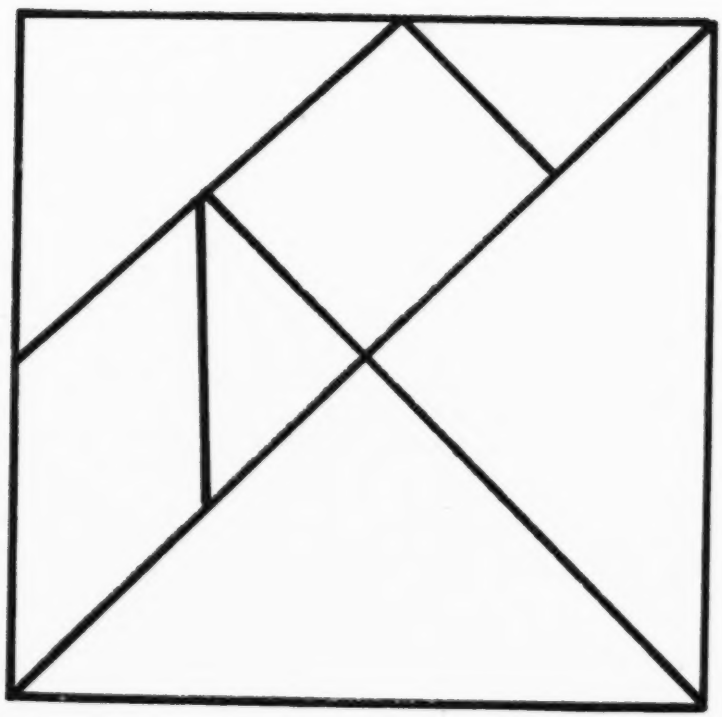
Variation:

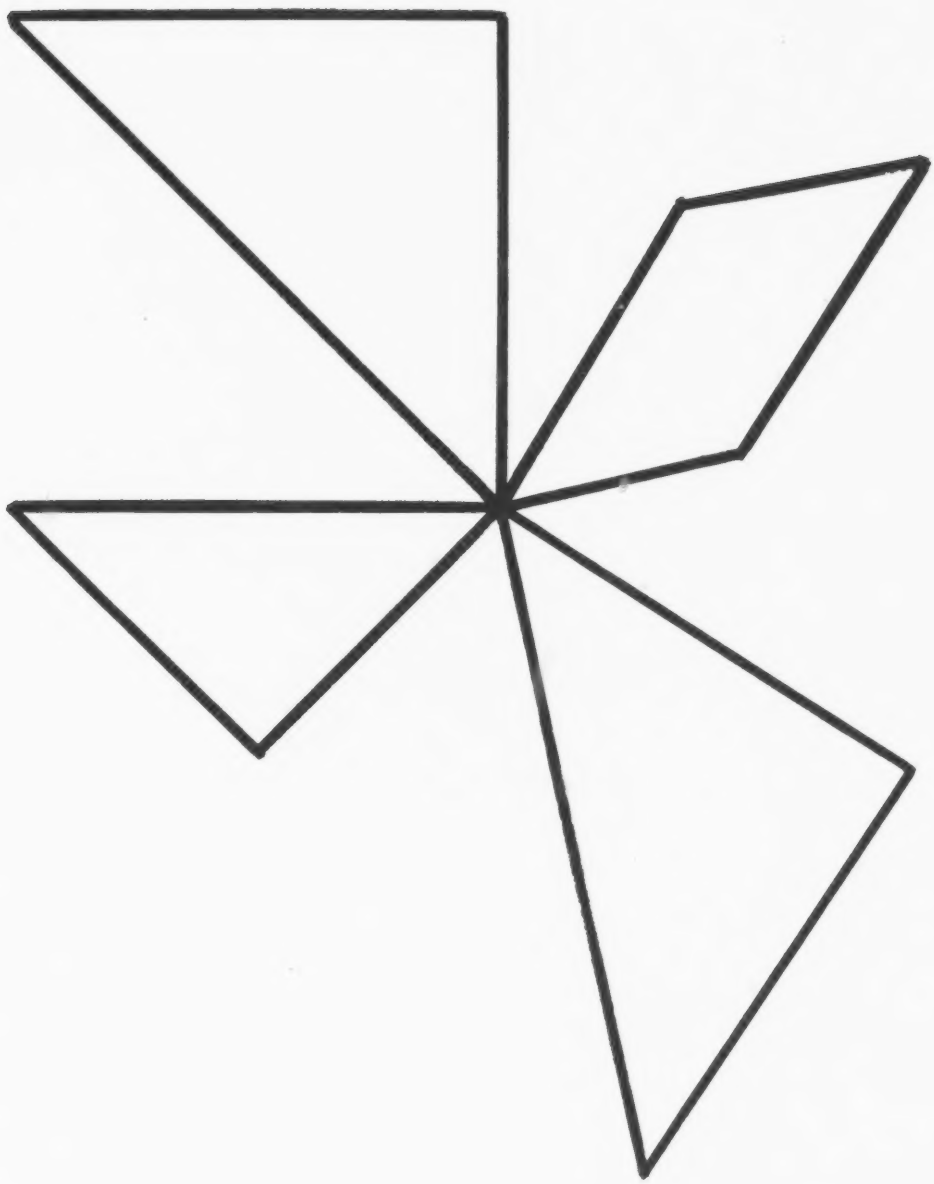
Coloring the pieces reinforces visual perception.

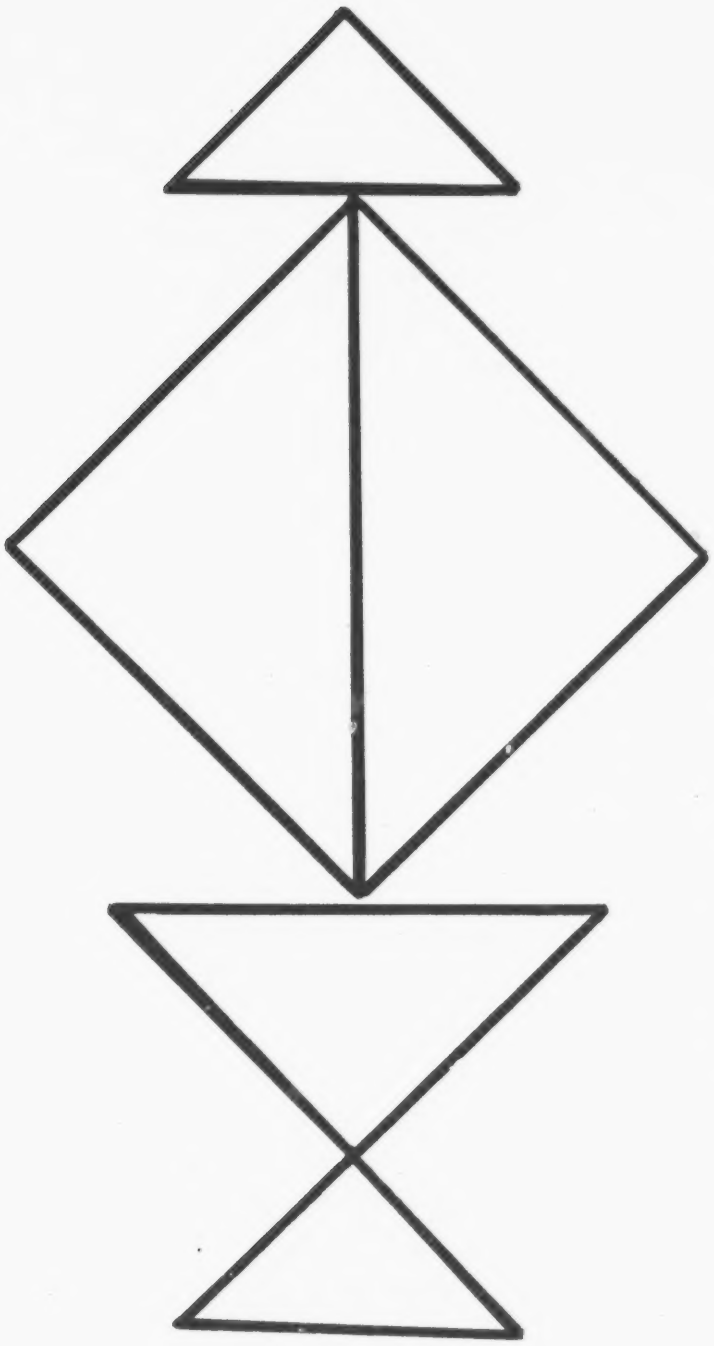
Objective:

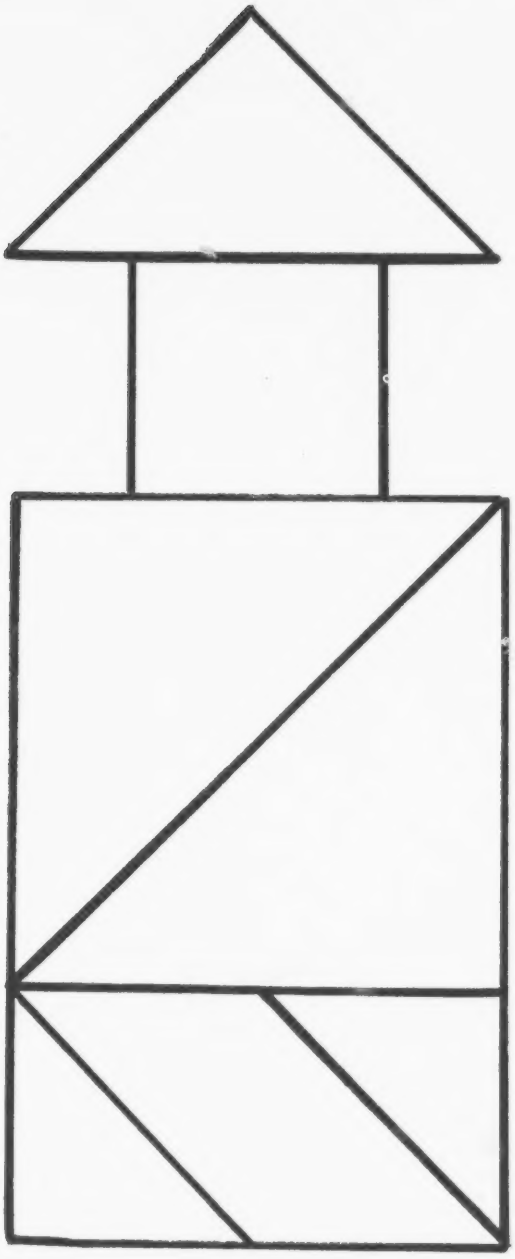
To build visual perception skills

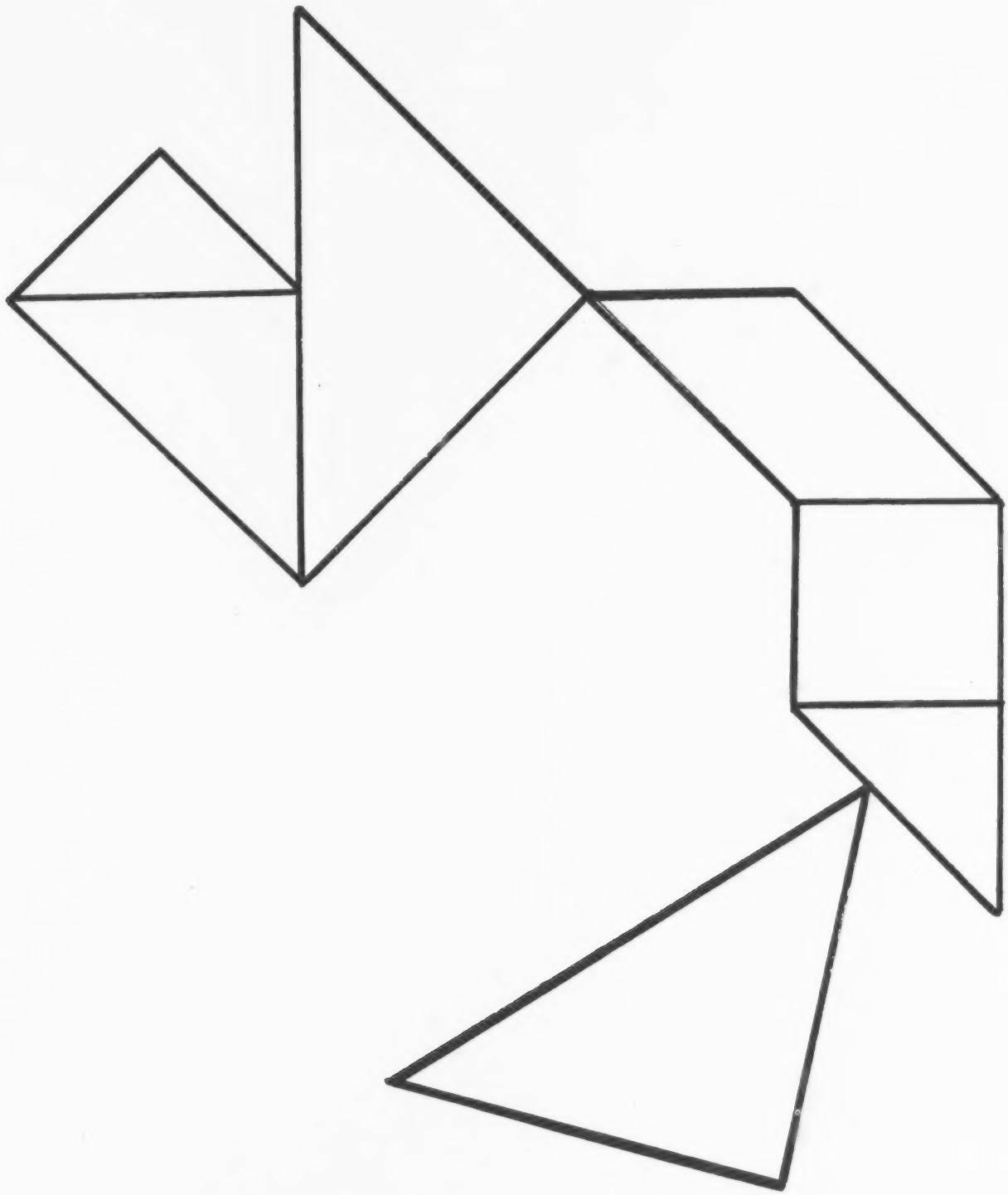
To develop creative thinking

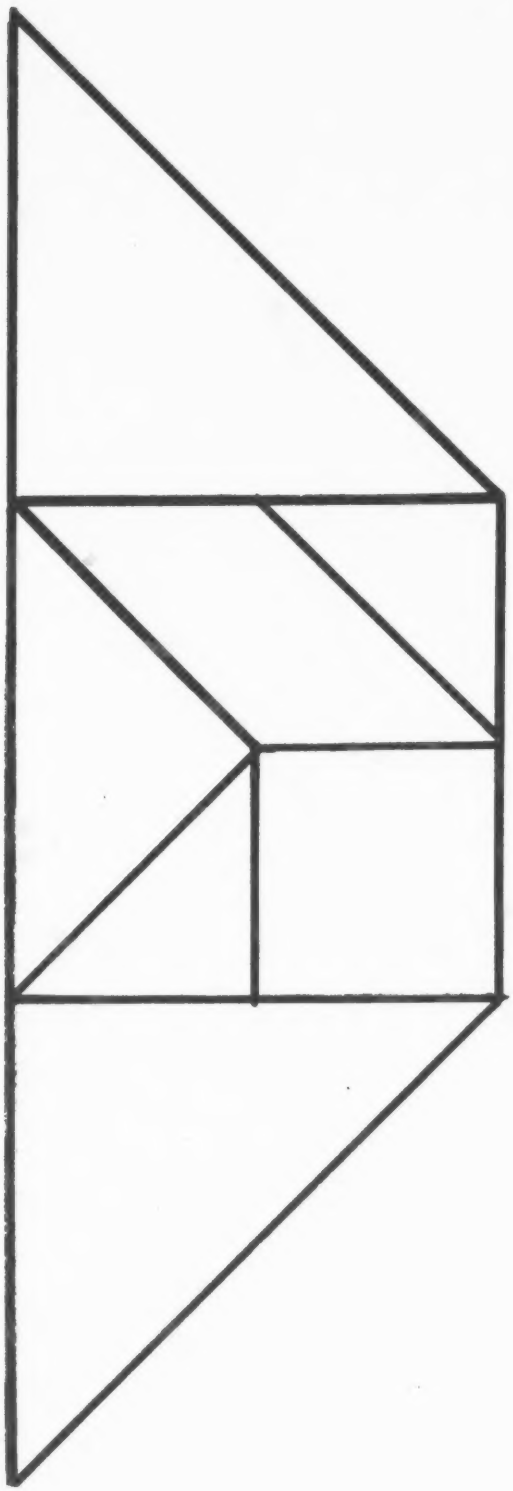


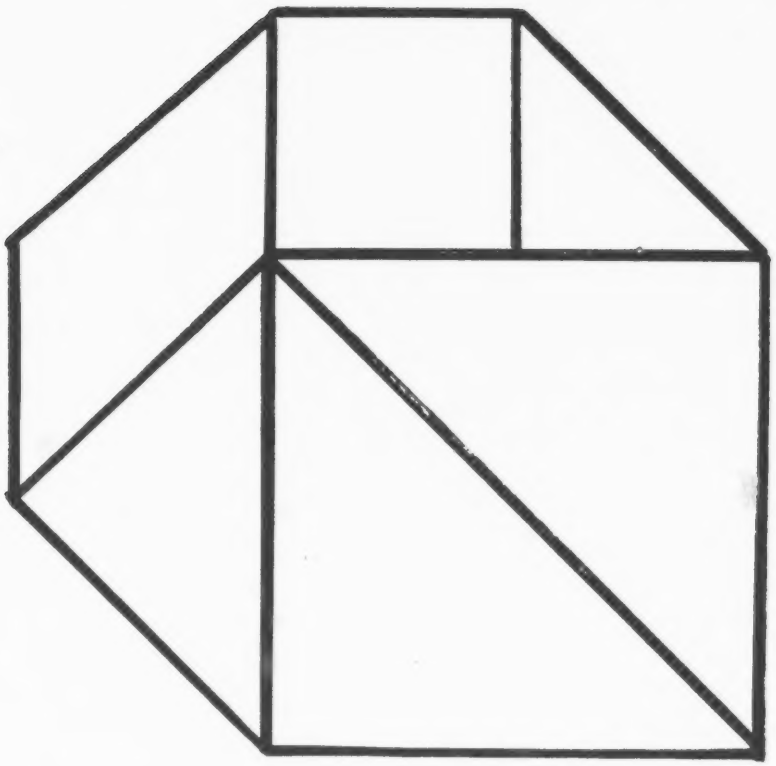


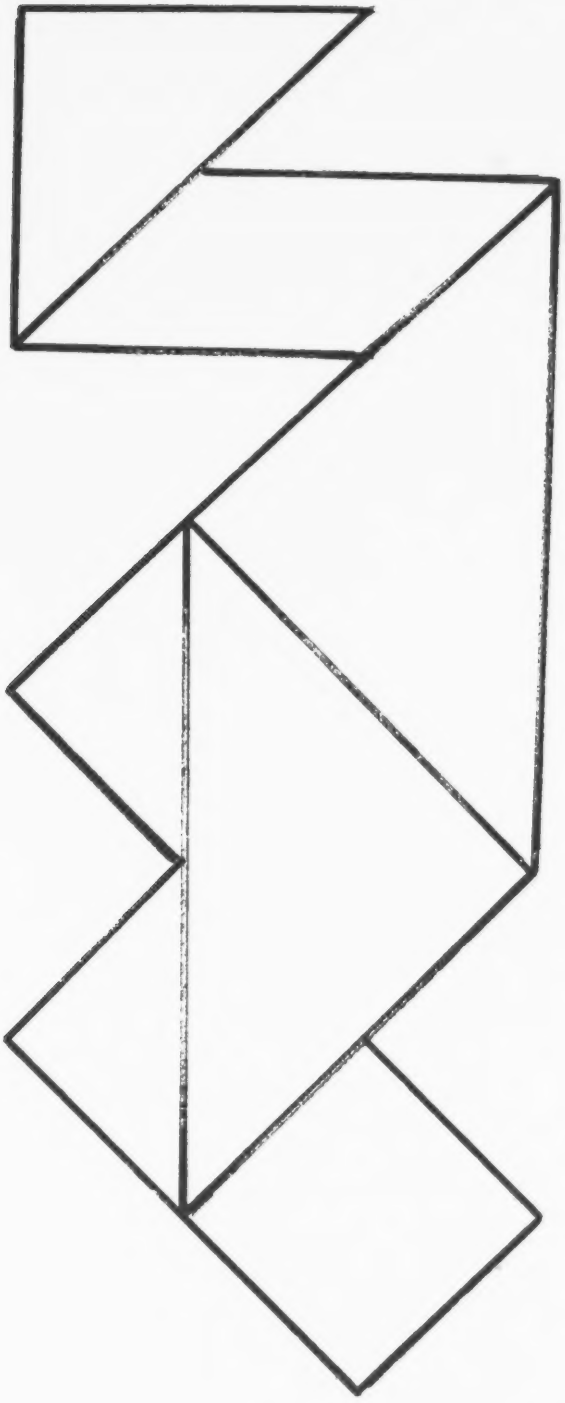


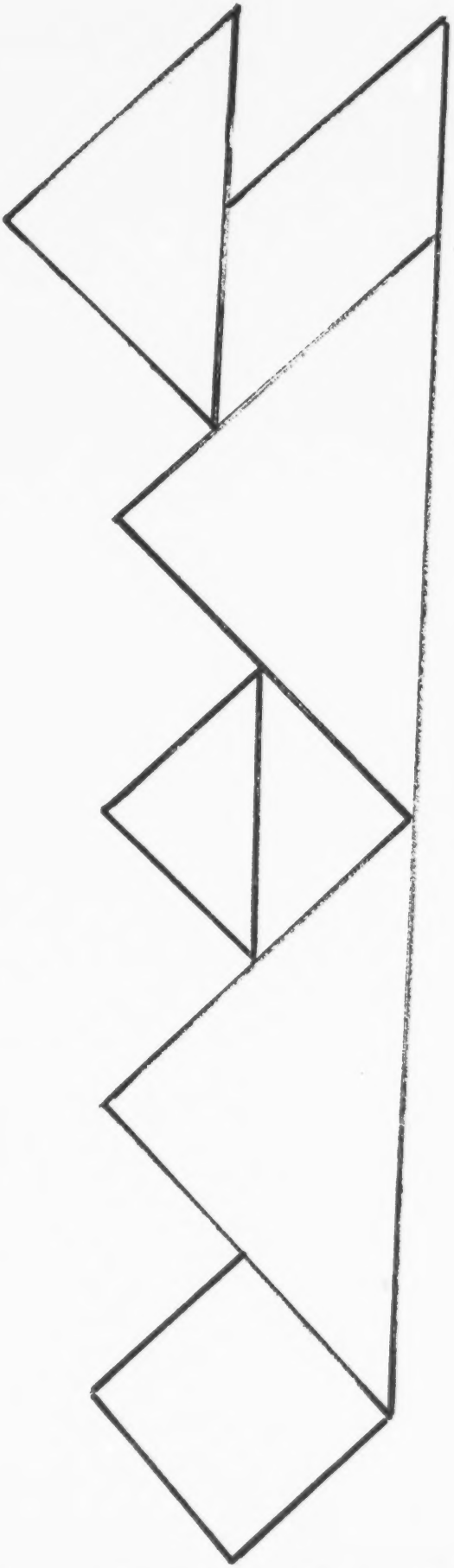












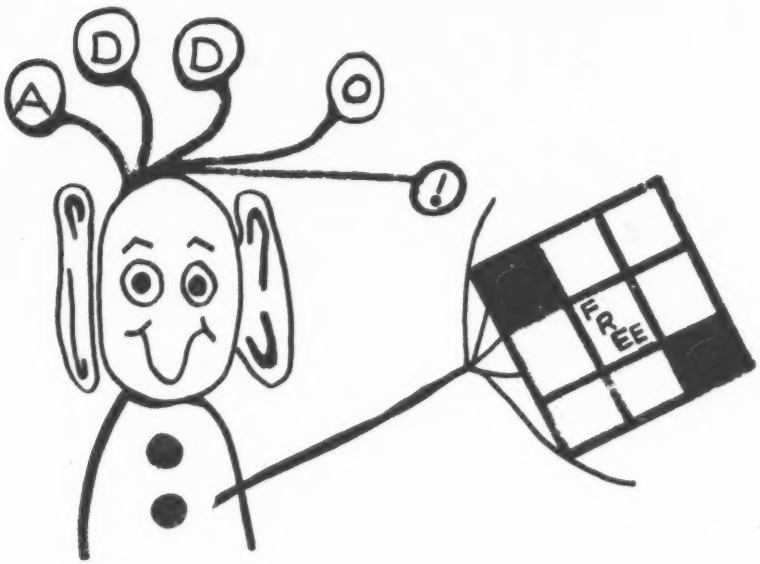
Three in a Row Addo

Supply flash cards using addition facts to ten.

Players use page 158 and fill in the squares with any number from 1 to 10. Numbers are placed in random order. Each number is used only once.

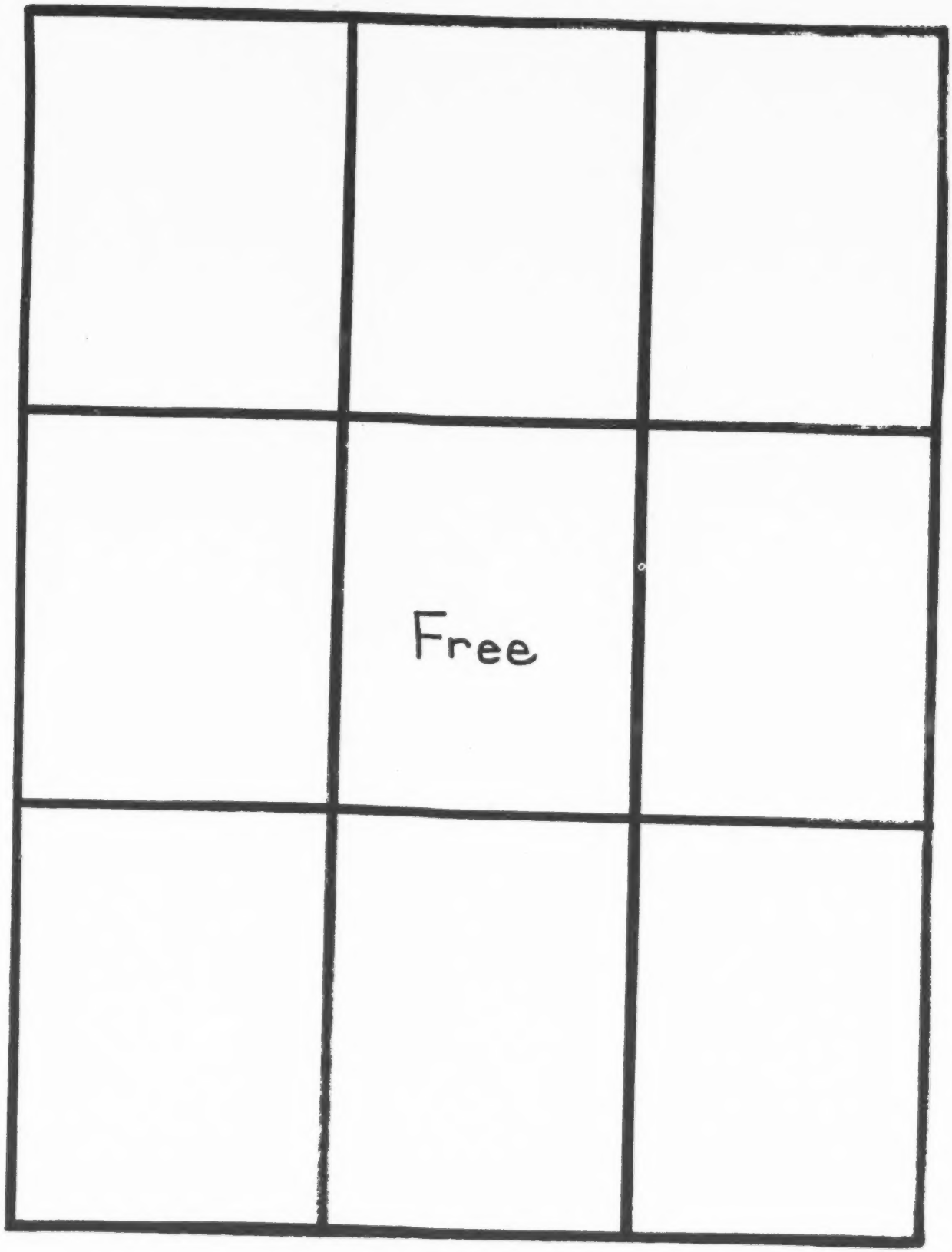
Game is played like Bingo. A leader selects one of the cards and reads it to the players. If a player has that number on his paper, he crosses it out or covers it with a marker.

Winner is the first player to get three in a row. He becomes the leader for the next game.



Objective:

To reinforce addition facts to sums of ten


Free

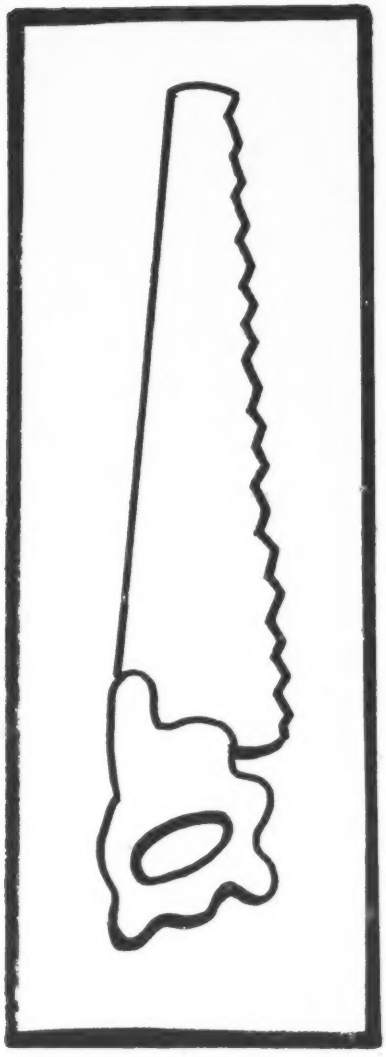
Tool Kit Activity

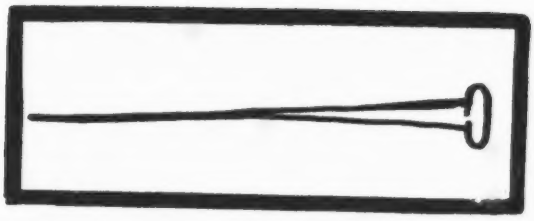
Use page 160.

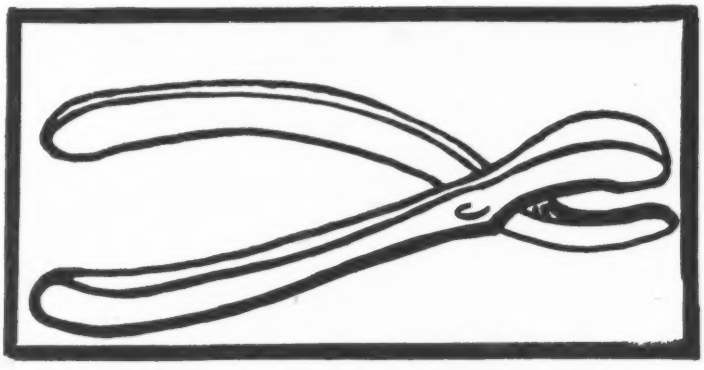
Children cut on lines around tools and paste on the line on page 161 that matches the length of the cut-out.

Objective:

To estimate linear measure







Tools

Tree House

Two to four children may play the game.

Each child colors a footprint on page 163. He cuts it out and uses page 164 to play the Tree House Game.

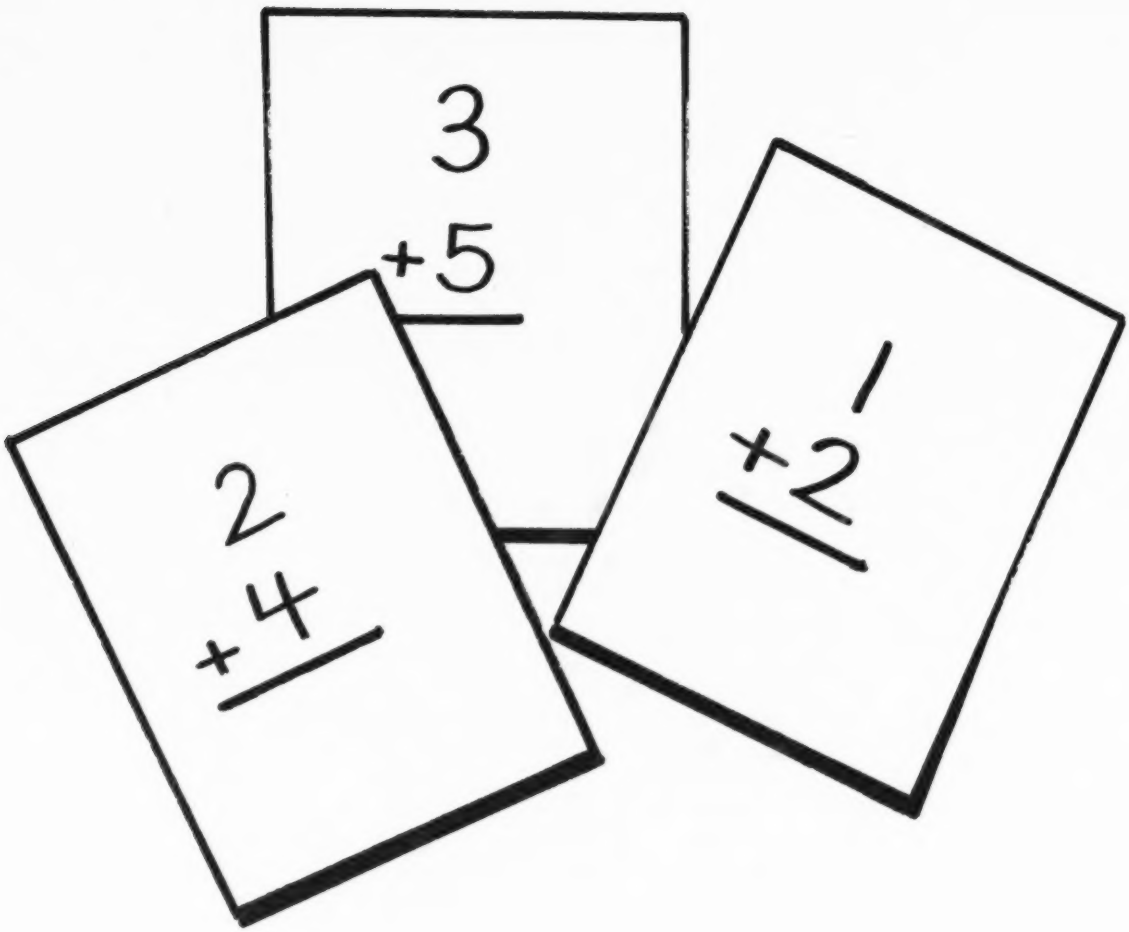
Flash cards provided by the teacher containing the addition facts are placed face down on the table. Children take turns choosing a card.

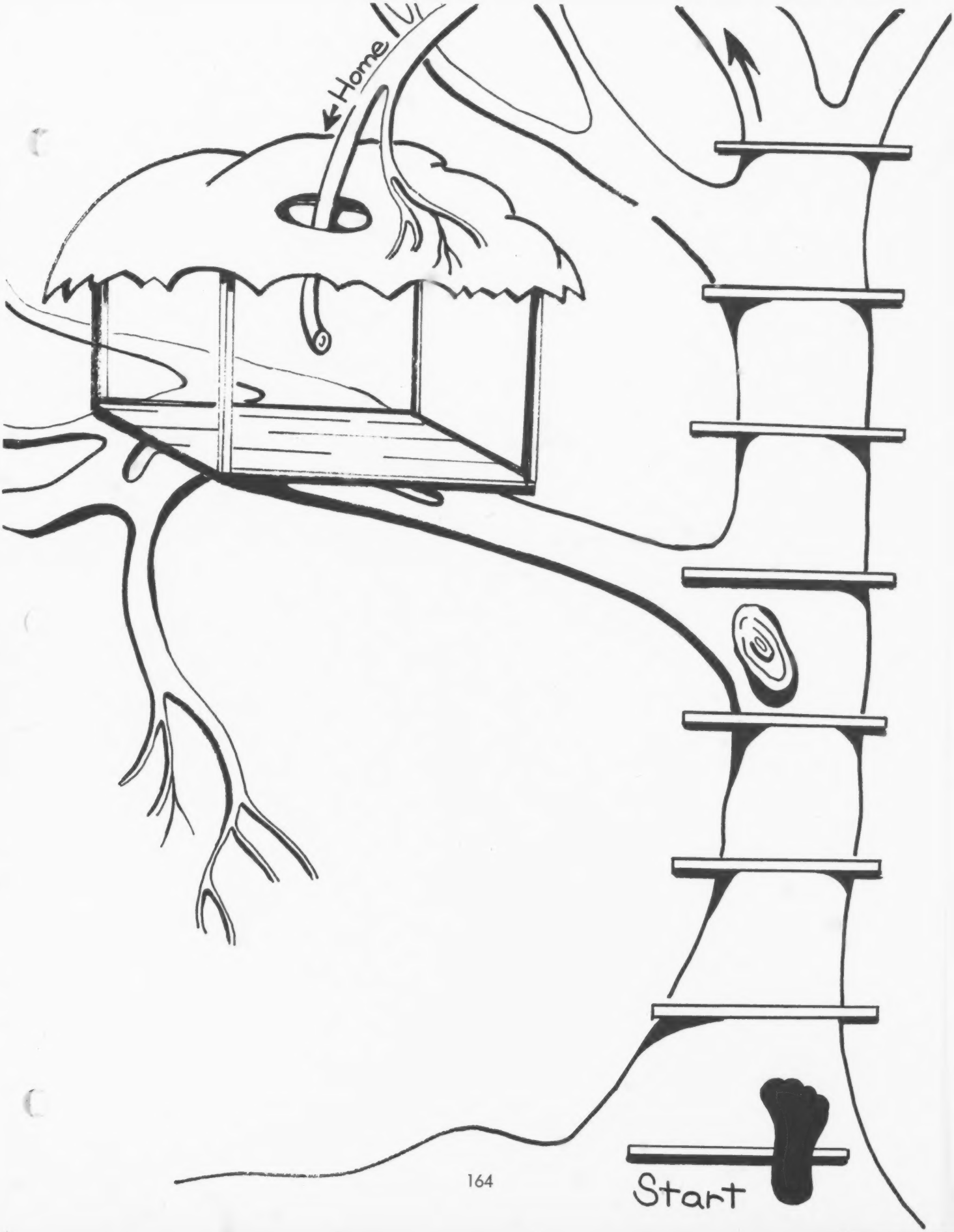
If a child gives the correct answer, he moves his footprint marker up the ladder one step.

Child who reaches tree house first wins the game.

Objective:

To reinforce addition facts


3
+5
2
+4
1
+2


Home
Start

What Am I ?

Materials:

Pages 166 to 173.

Crayons and scissors (optional).

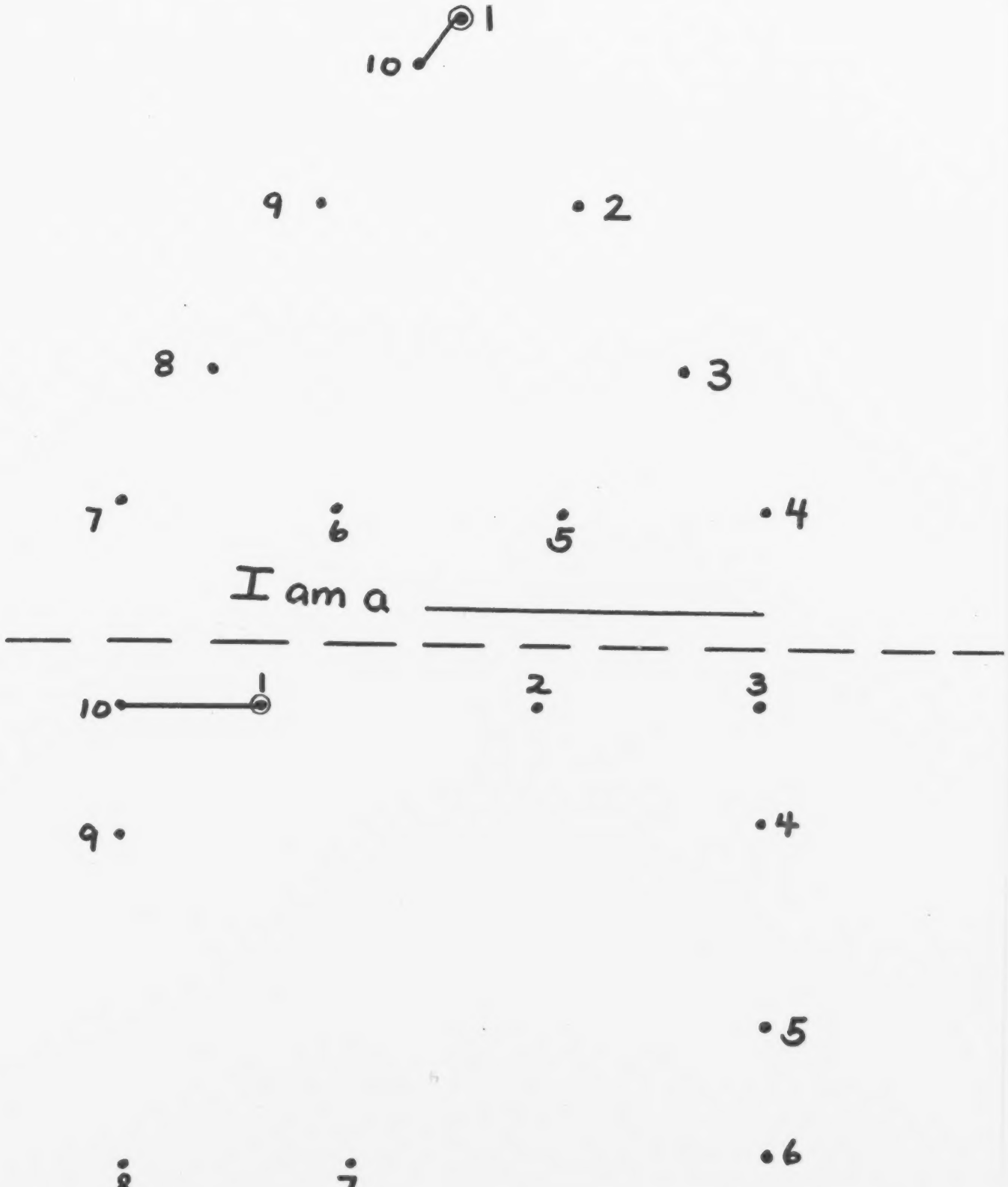
The What Am I activities are a series of fascinating follow-the-dot pictures.

The children will have fun naming their pictures and coloring them.

Pages may be made into a book, or figures may be cut out and used to build reading skills.

Objective:

To reinforce the counting order of numbers


1
10
9
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I am a
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4
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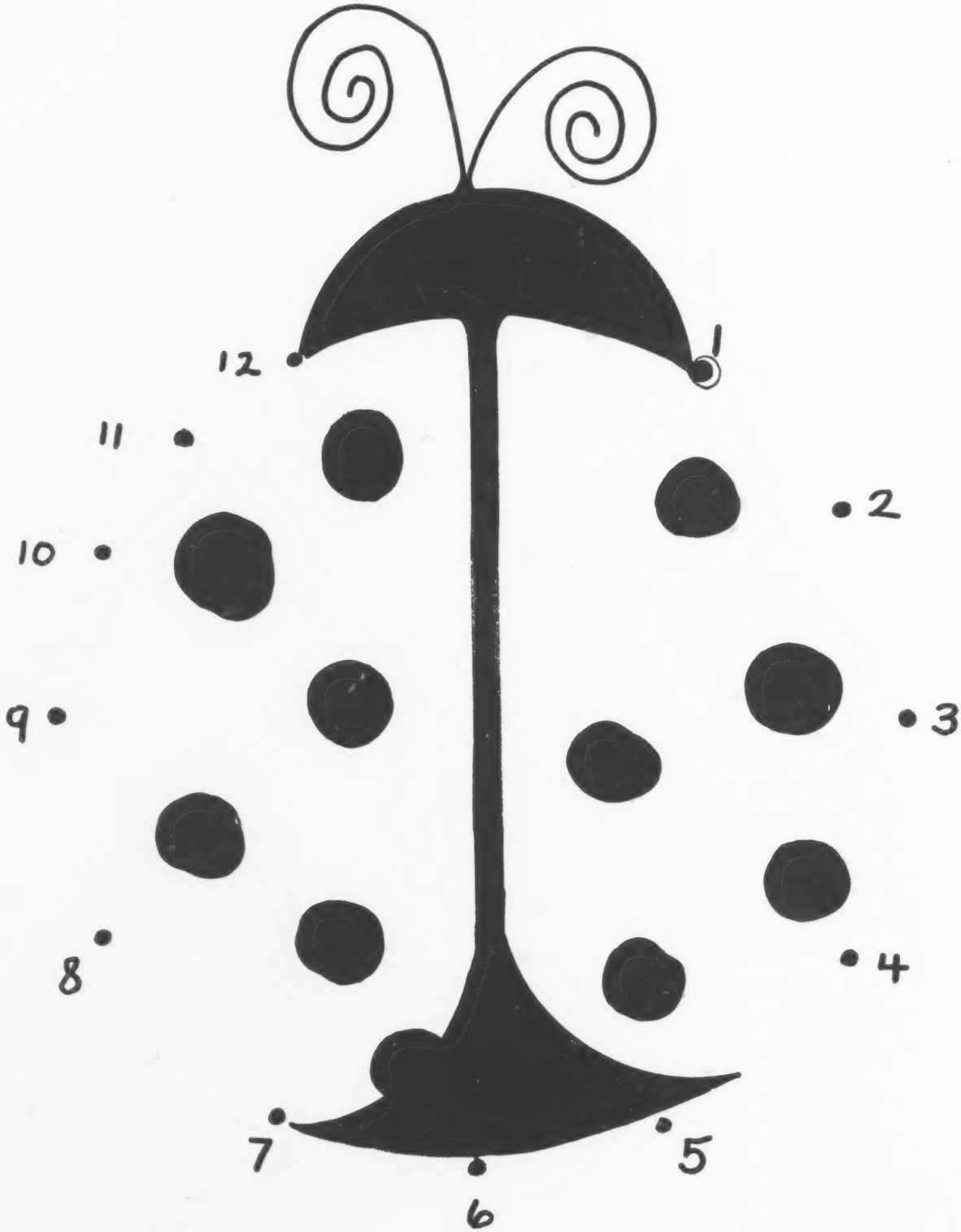
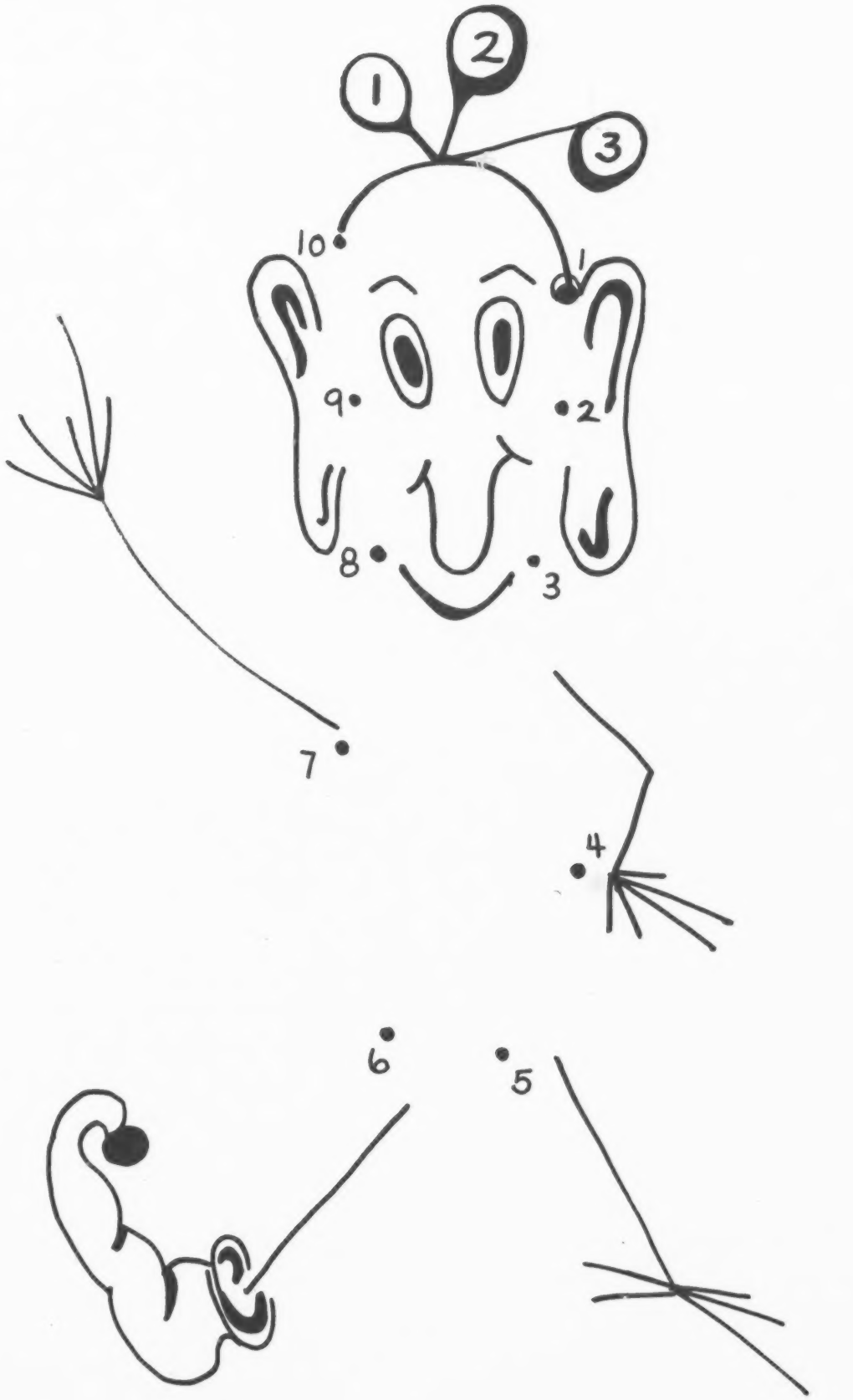
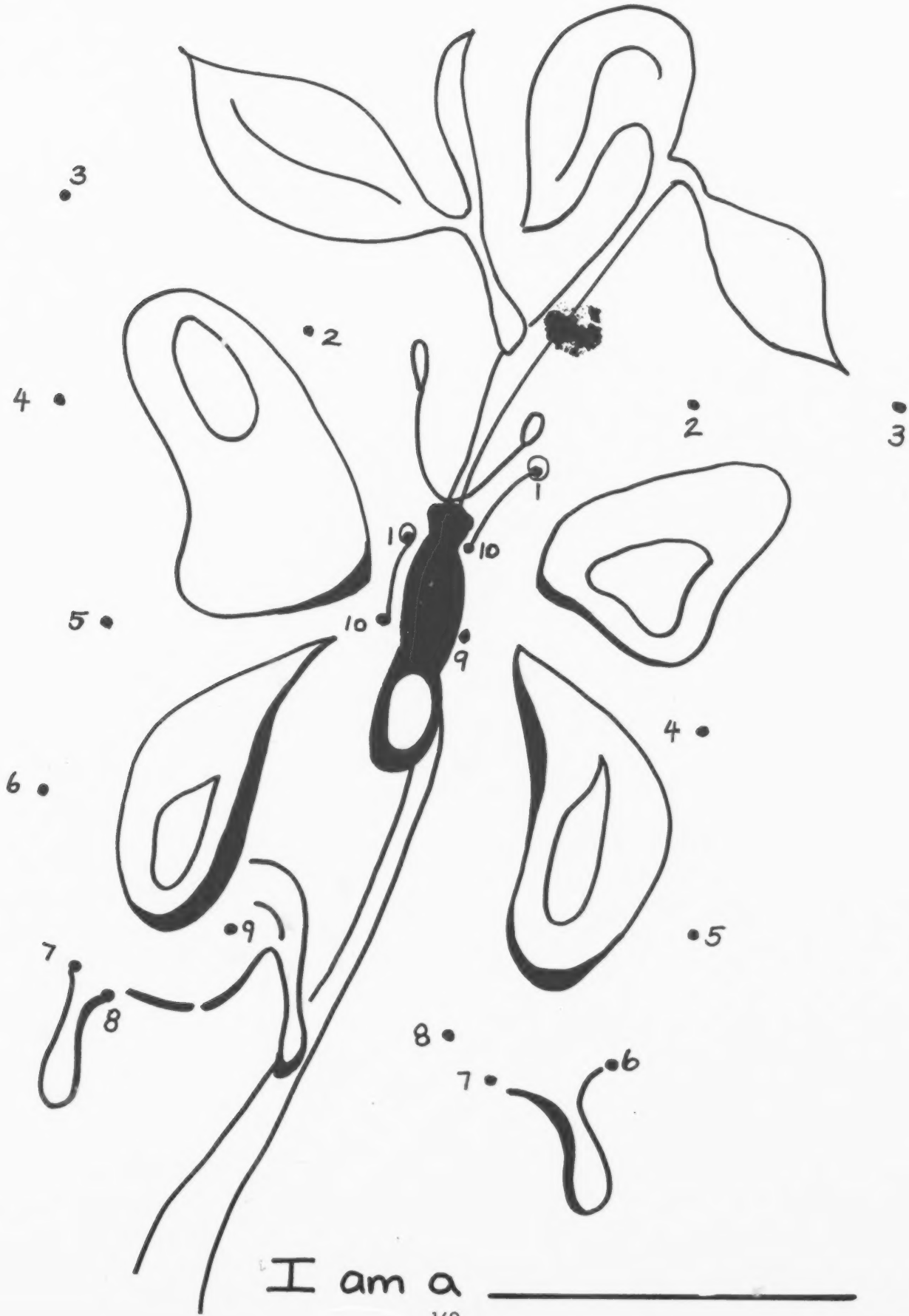
8
7
I am a



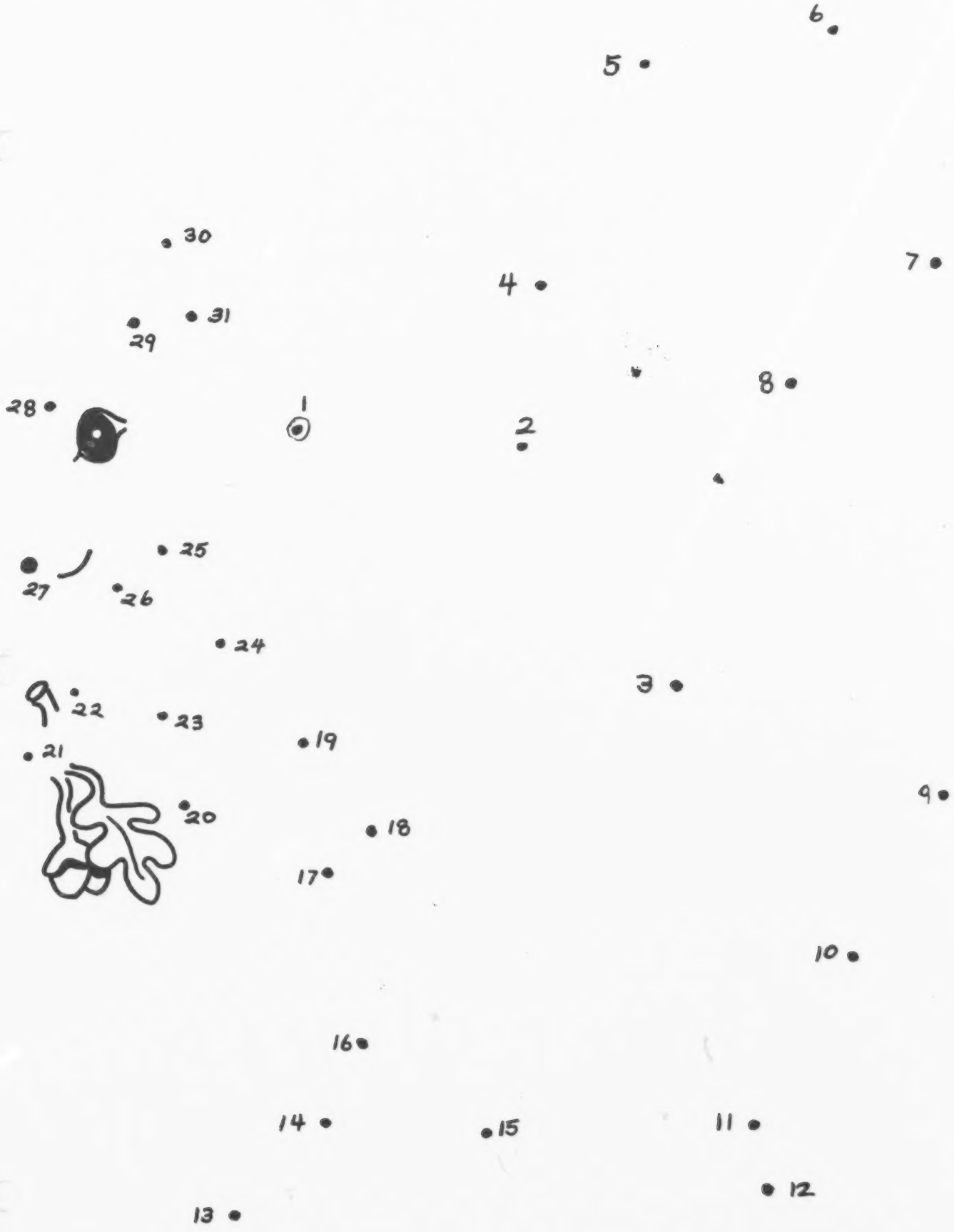
I am a _____



I am _____



I am a _____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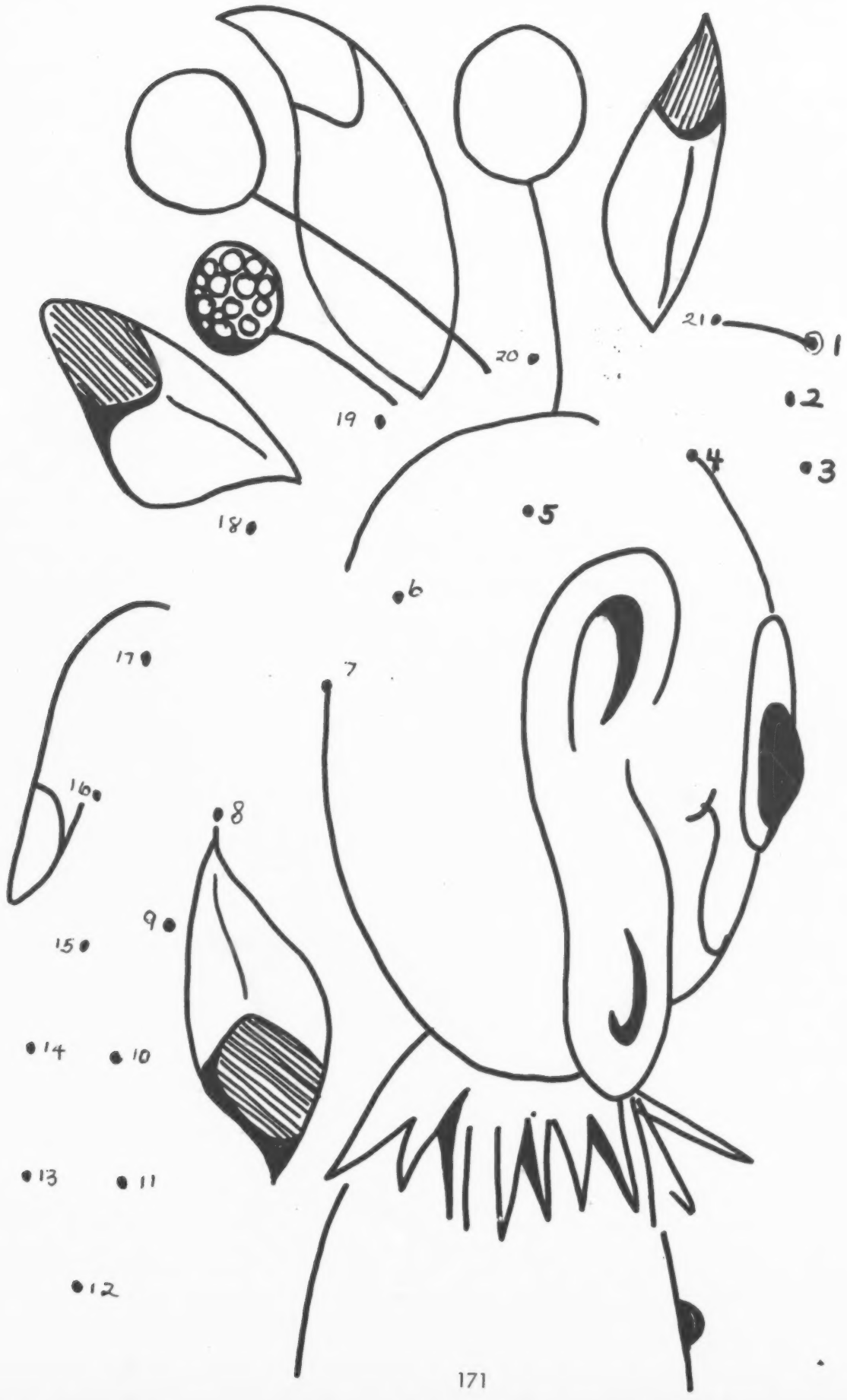
I am a _____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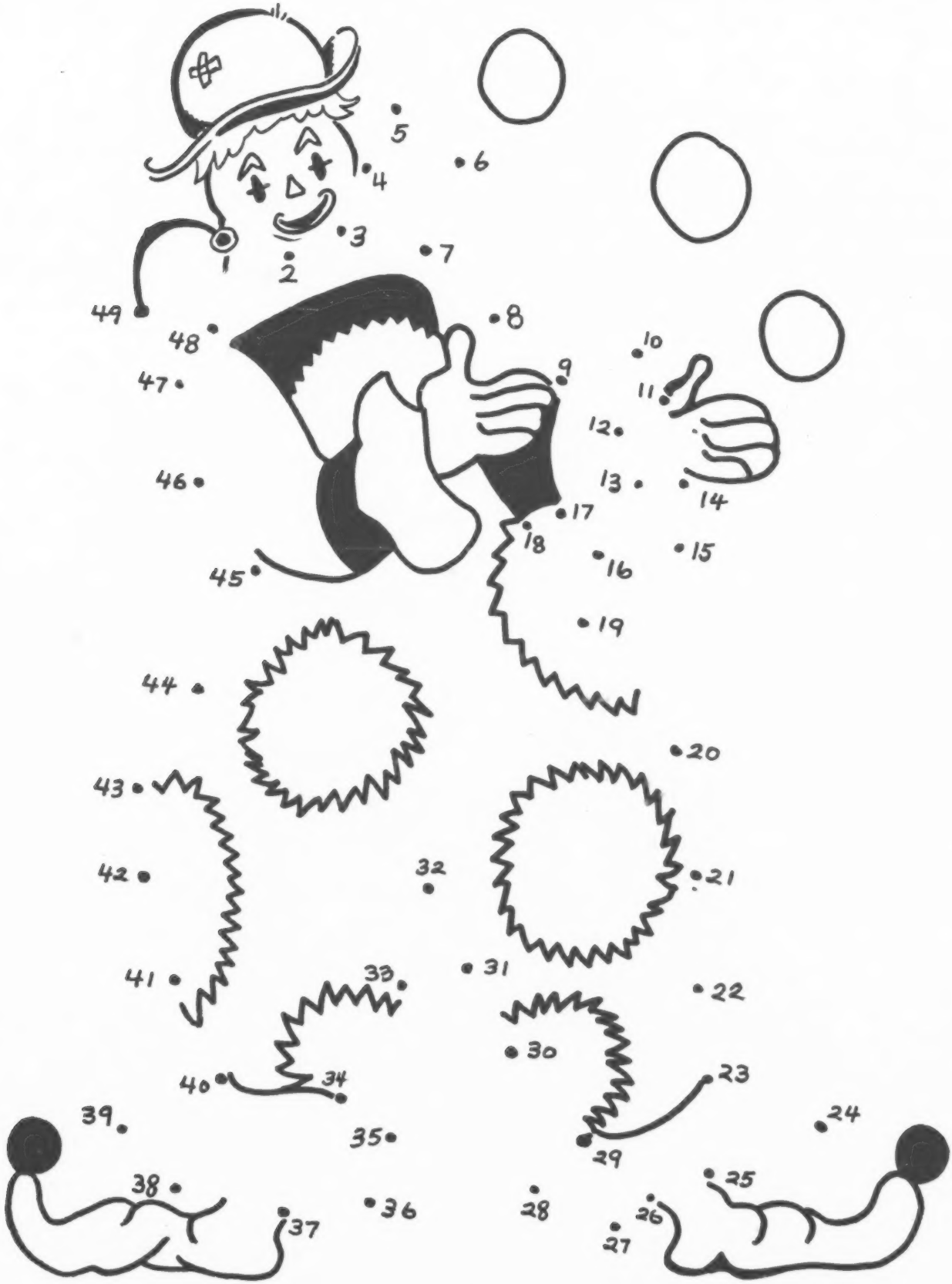
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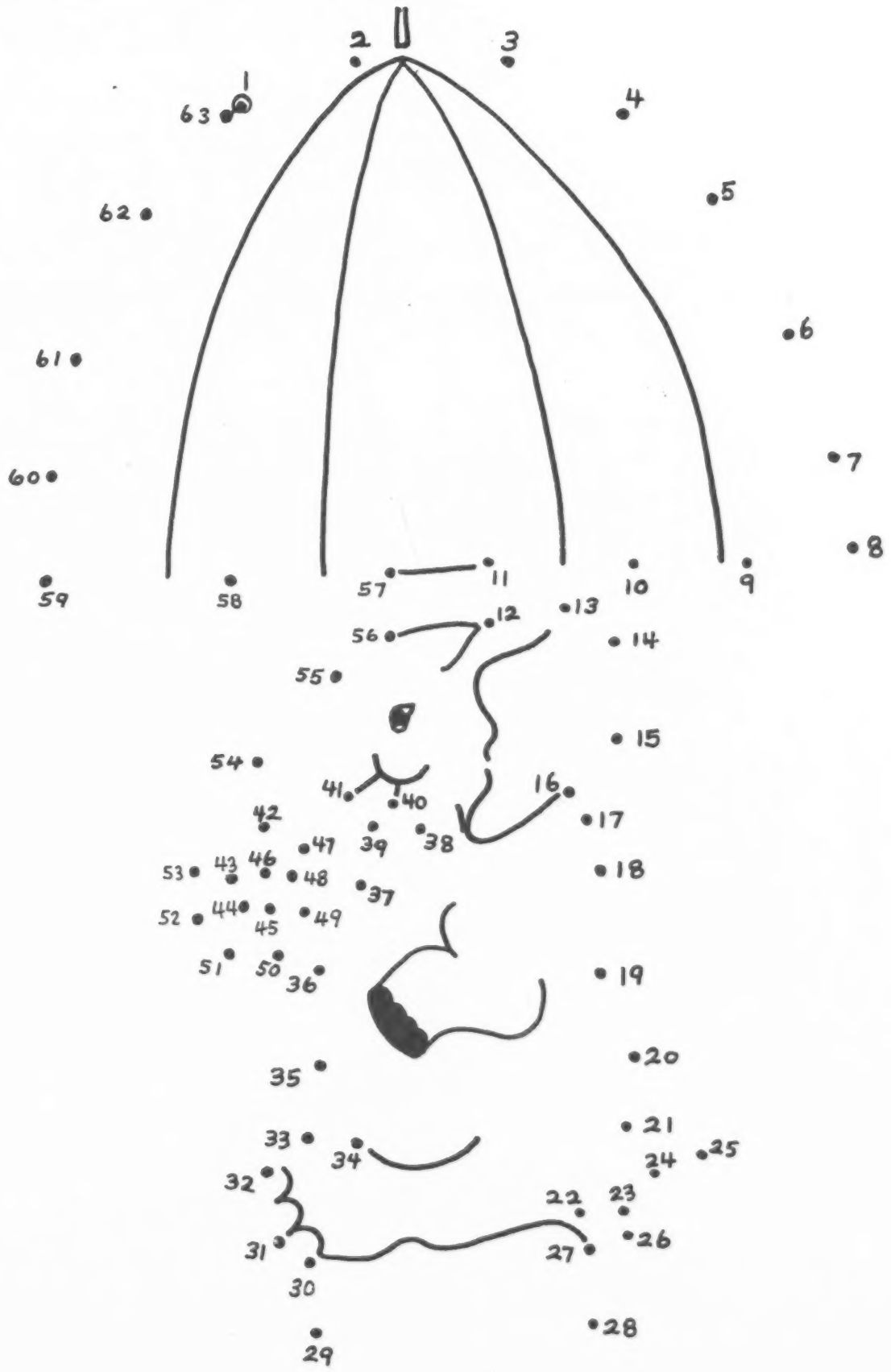
I am a _____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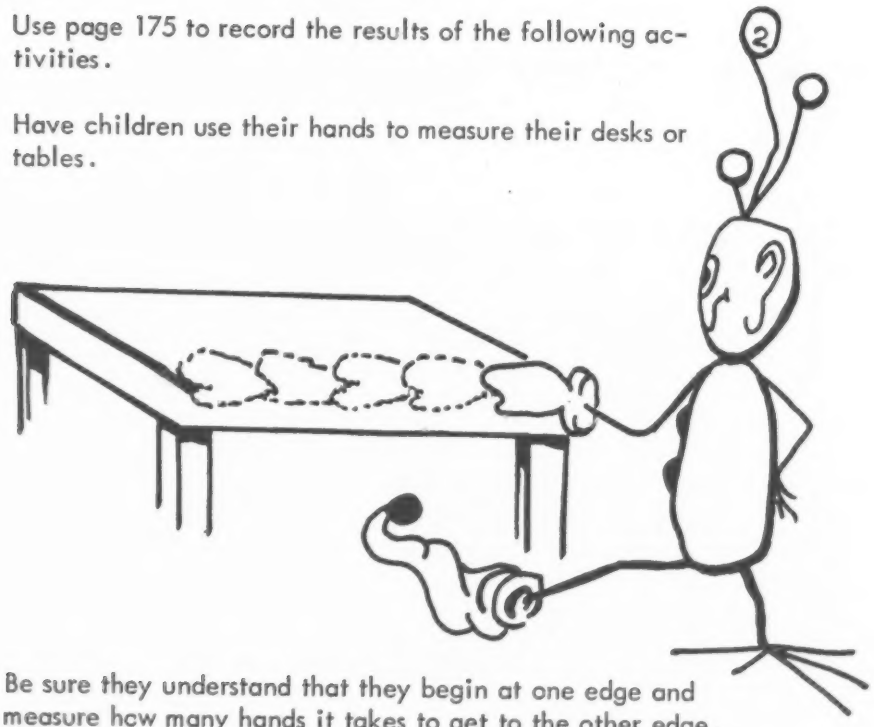
63

I am an _____

What's My Measure?

Use page 175 to record the results of the following activities.

Have children use their hands to measure their desks or tables.



Be sure they understand that they begin at one edge and measure how many hands it takes to get to the other edge, rounding off at the end.

Children next measure their desks using a book, then a shoe, a pencil, an arm, and last, a ruler.

Let the children compare their measurements and discover the variety of answers when all measure the same desk.

Lead the group into discovering that the ruler gives the same measurement for everyone.

Objective:

To understand the need for a standard unit of measure

My desk measures

_____ hands

_____ books

_____ shoes

_____ pencils

_____ arms
(from elbow to tip of longest finger.)

_____ rulers

Where's My Cage?

Use pages 177 to 179.

Cut out and display the animals and their cages on pages 177 and 178. Place each animal next to a cage.

Give children page 179. They fill each cage with the number that is on the animal next to that cage in the teacher's display.

First player to finish is the winner and he may change the cages for the next game.

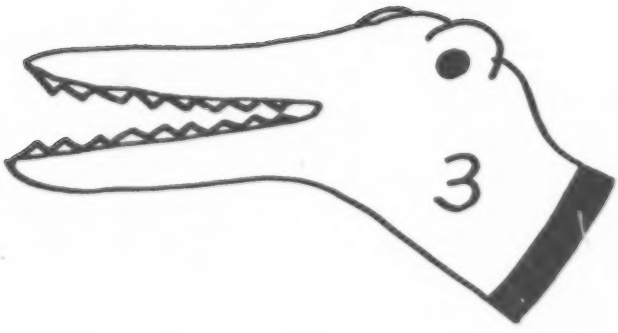
For younger children, use only 3 animals and 3 cages with ditto page 180.

Objective:

To understand the rule for substitution

1

2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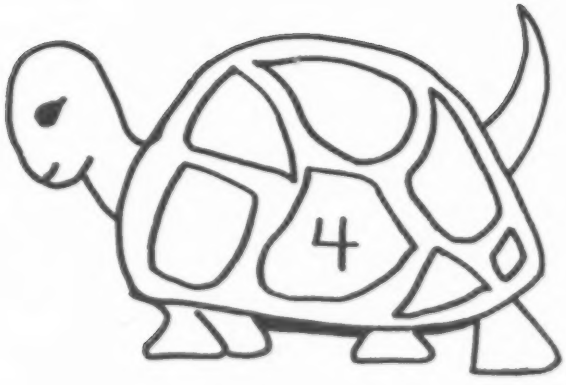
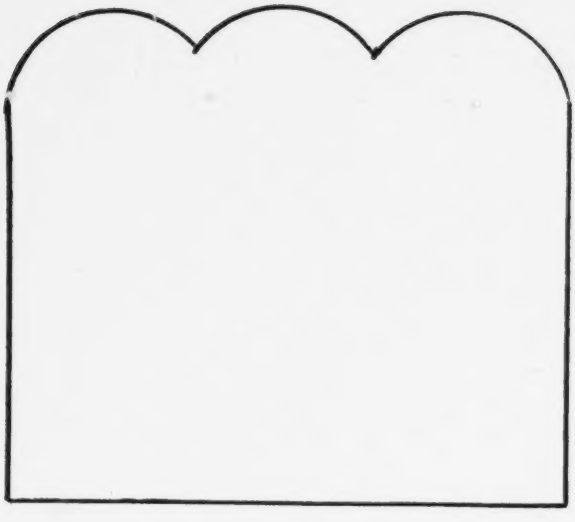
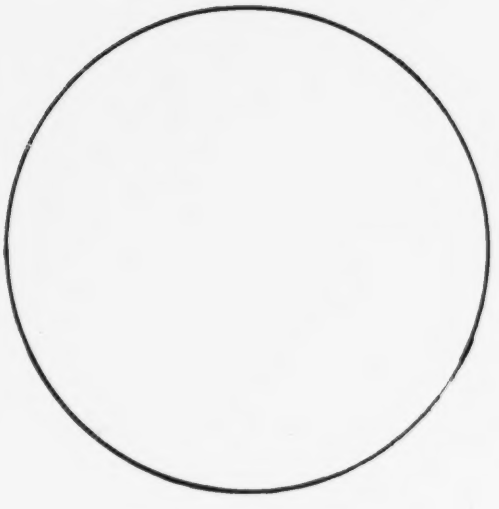
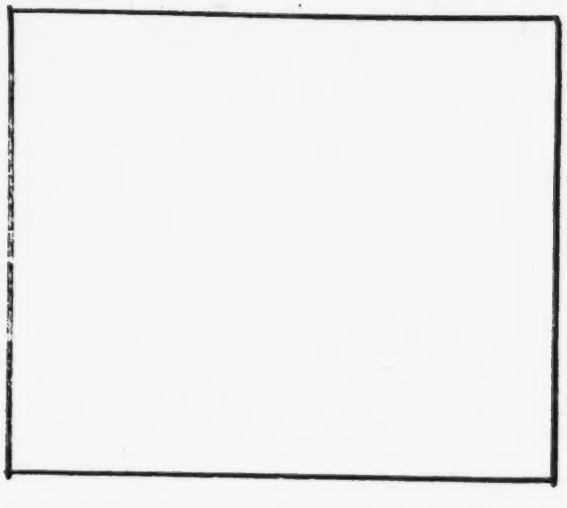

4

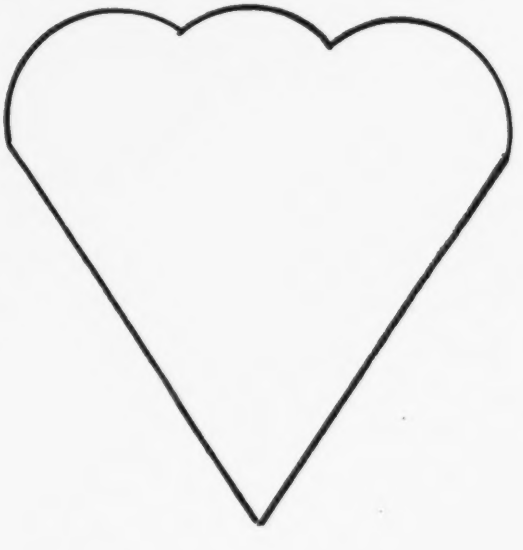
5

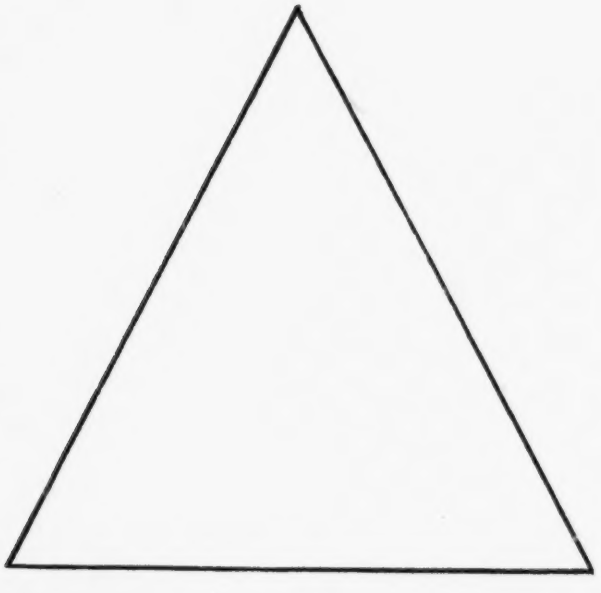
6

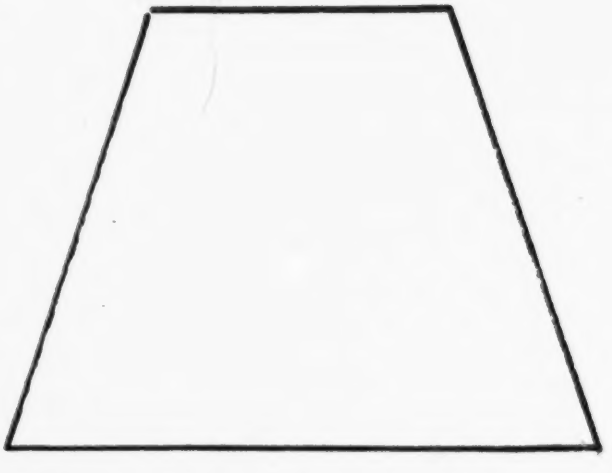


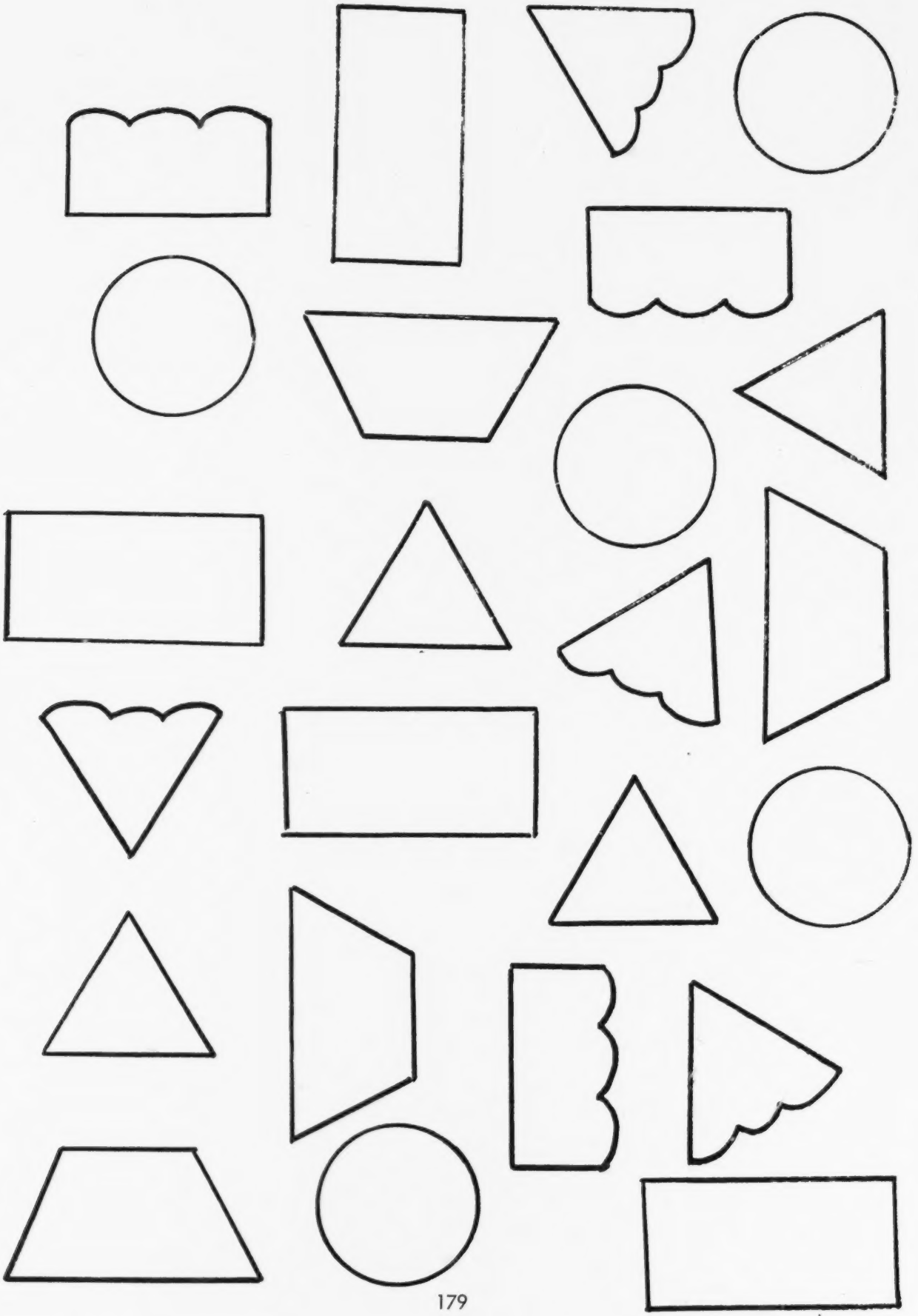


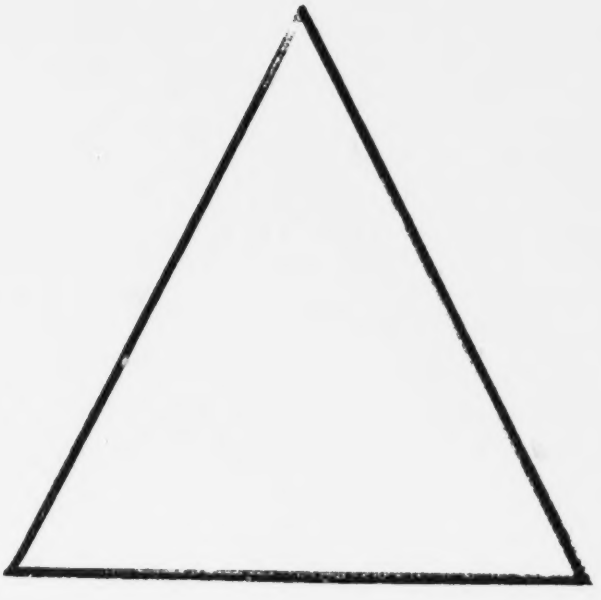


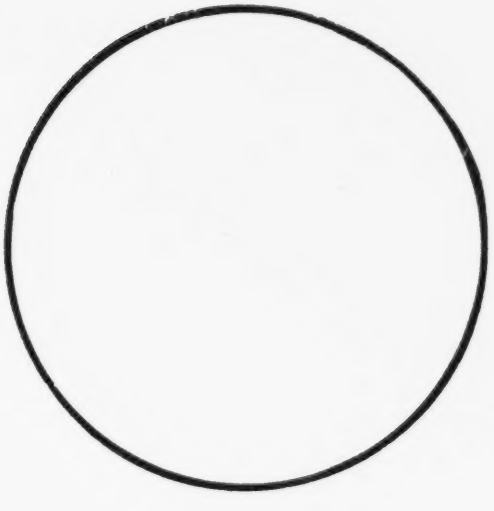


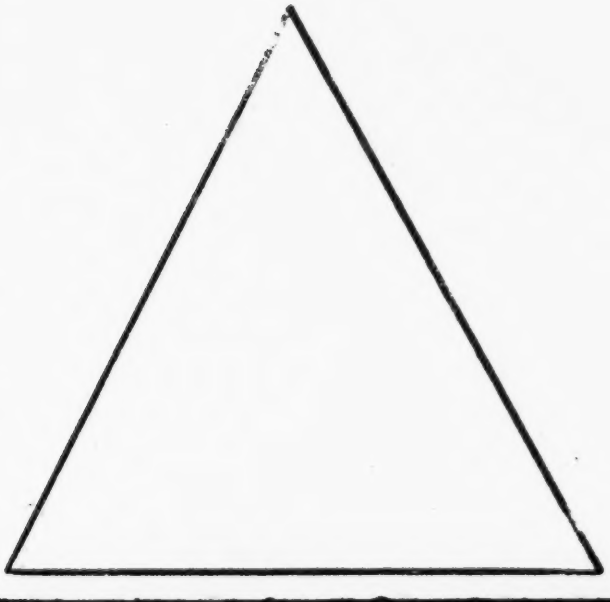


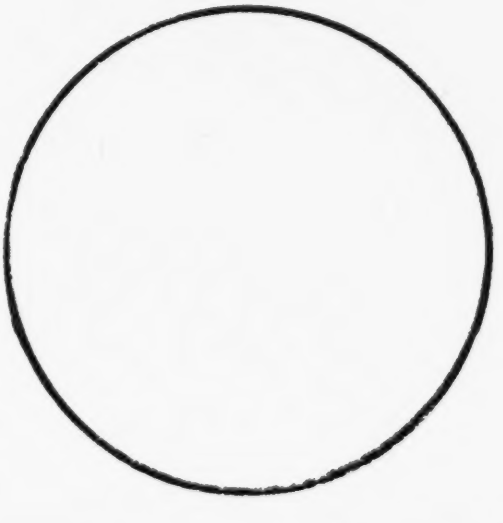












Where Should My Numbers Go?

Use page 182, 183, or 184.

A leader tosses a die and the players put the number showing on the die in any one of the Game 1 spaces he chooses.

The leader tosses again, as many times as there are spaces for that game, and at each toss the players choose any empty place to put the number tossed. When all spaces are filled, the winner is the child whose number reads as the highest number and he is the leader for the next game.

Discuss with the players all possible scores from the numbers tossed.

For example, if a game included the numbers 2, 4, and 6, the possible combinations would be:

2, 4, 6
2, 6, 4
4, 6, 2
4, 2, 6
6, 4, 2
6, 2, 4

Winner would have 6, 4, 2 and read off 642.

Variation:

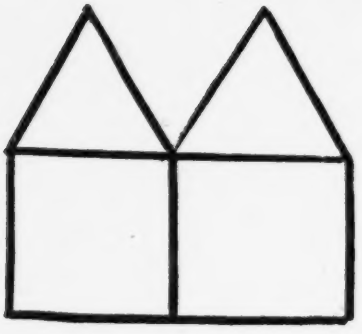
Winner is the player with the lowest score.

Objectives:

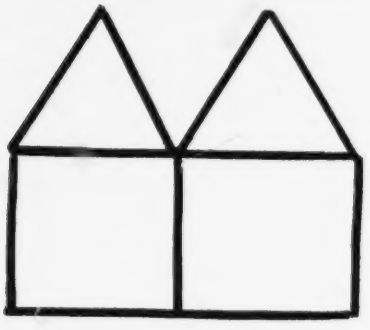
To understand place value

To read numbers

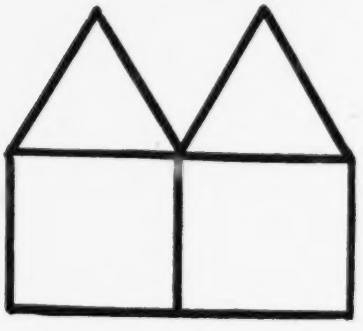
Game 1



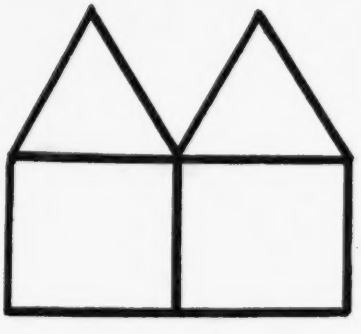
Game 2



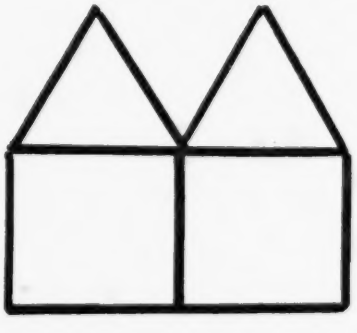
Game 3



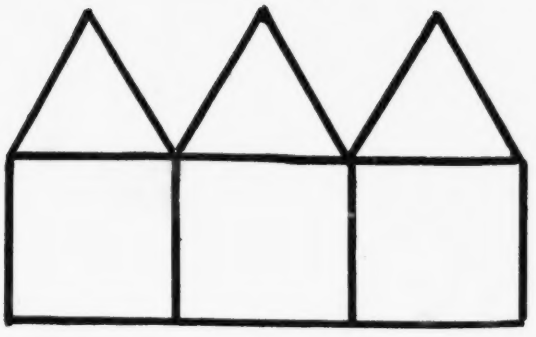
Game 4



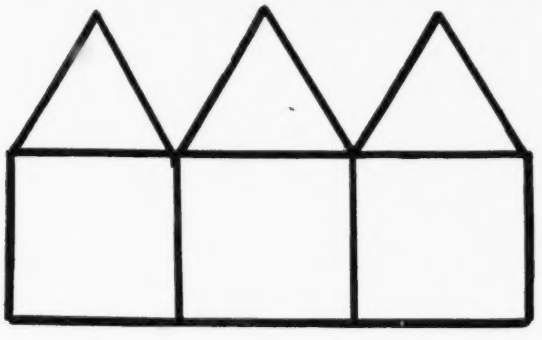
Game 5



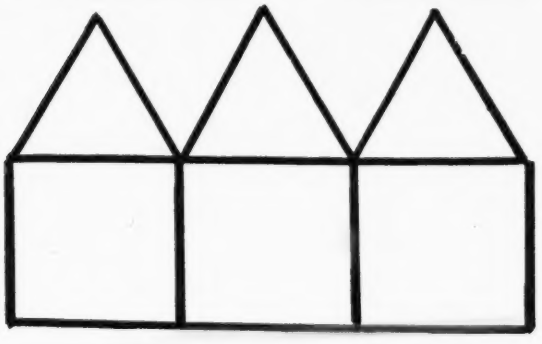
Game 1



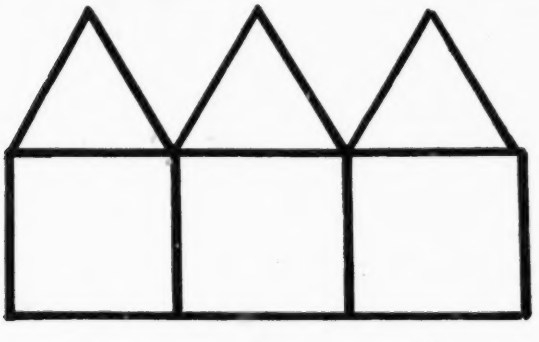
Game 2



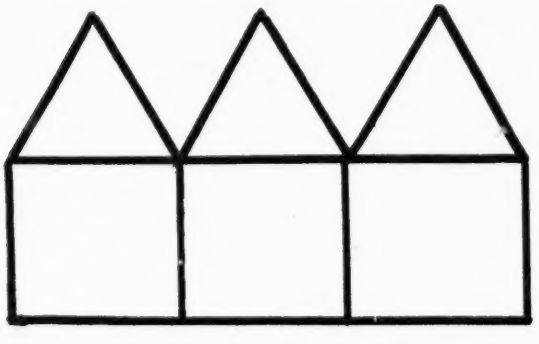
Game 3



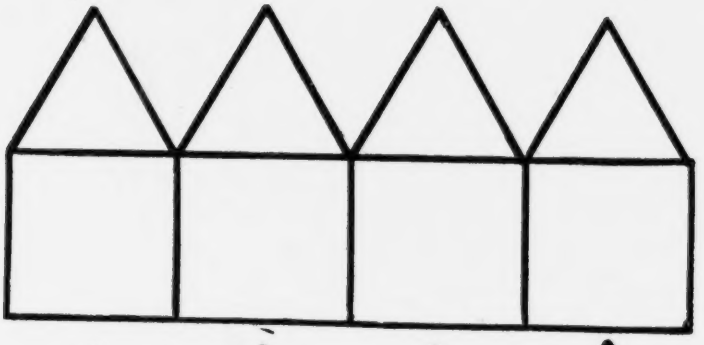
Game 4



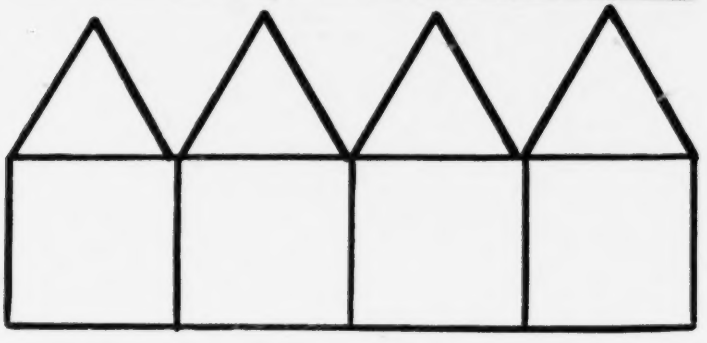
Game 5



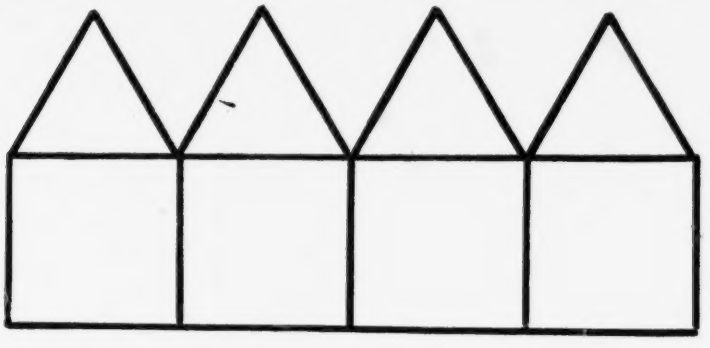
Game 1



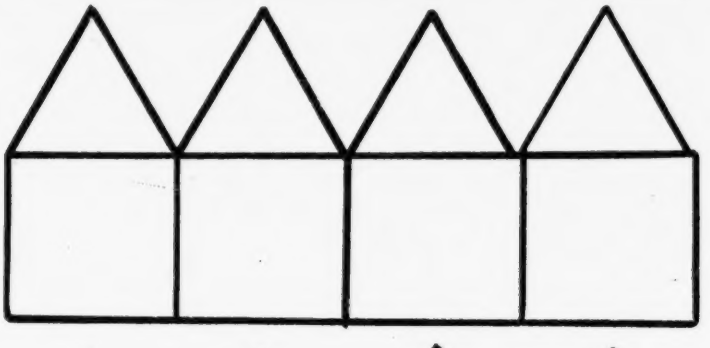
Game 2



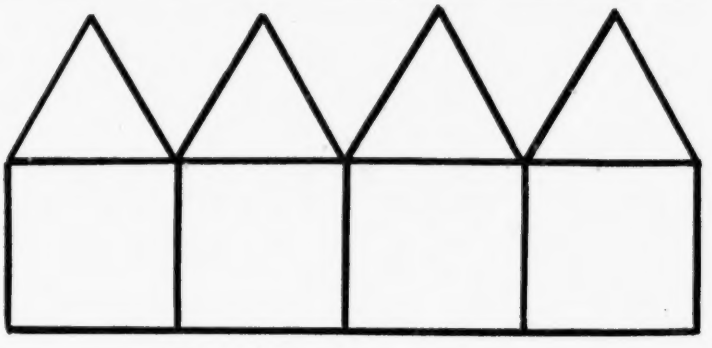
Game 3



Game 4



Game 5

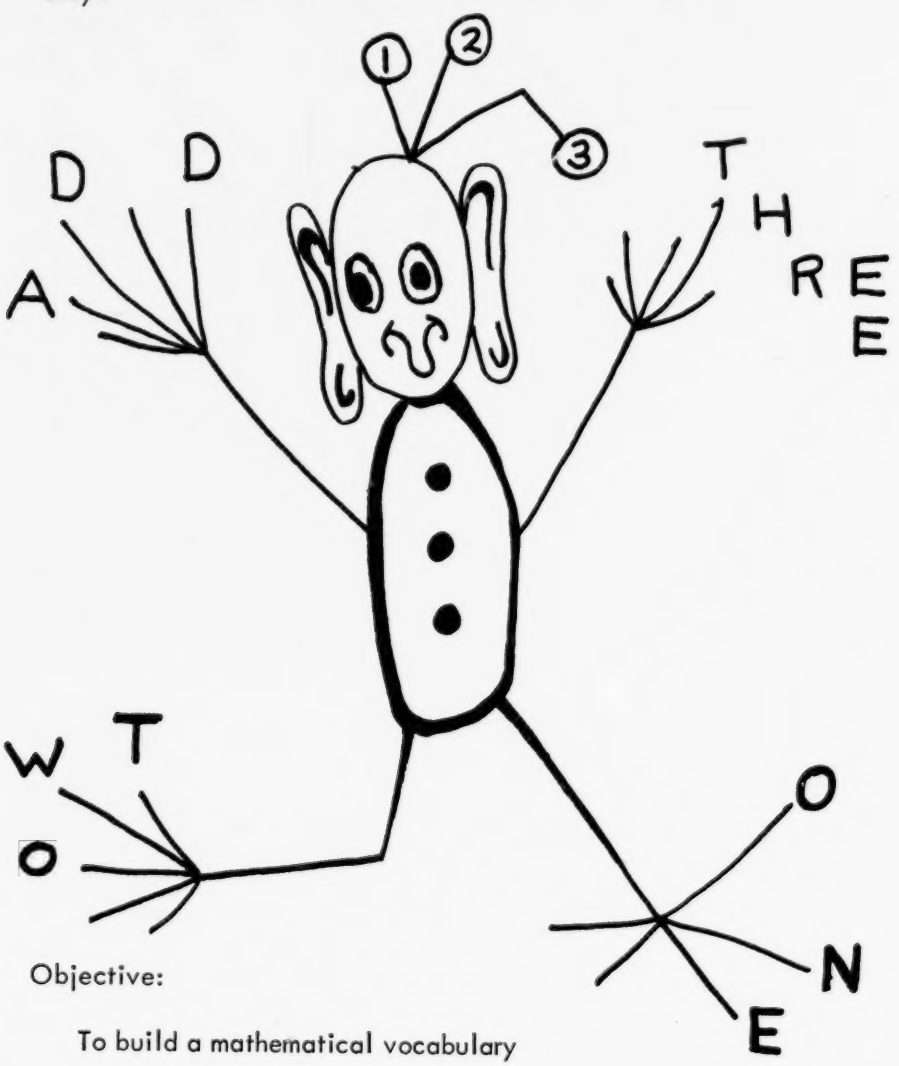


Word Searching

Use pages 186 to 190

Let children find the mathematical terms.

Words are hidden horizontally, vertically and diagonally only.



Objective:

To build a mathematical vocabulary

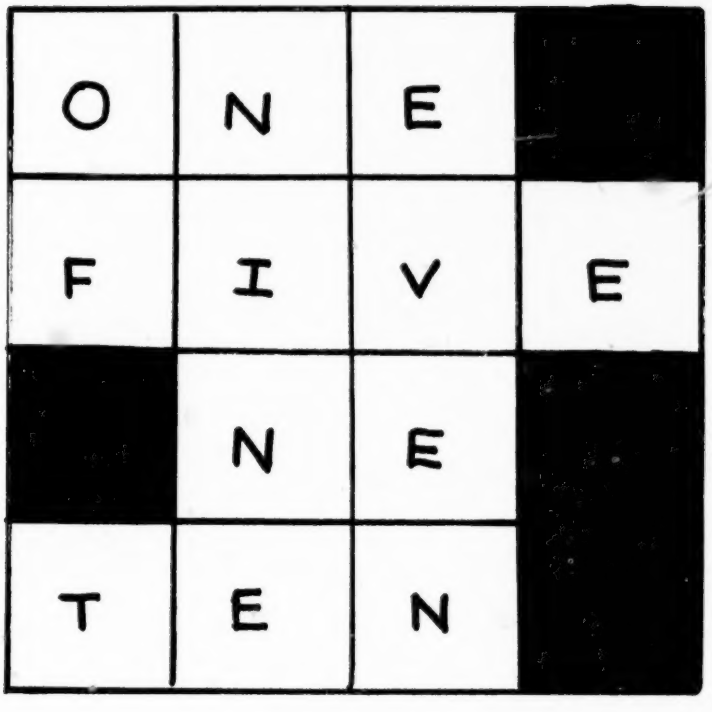
T	H	R	E	E
	O			O
	N		W	
	E	T		

Find 3 math words

_____

_____

_____

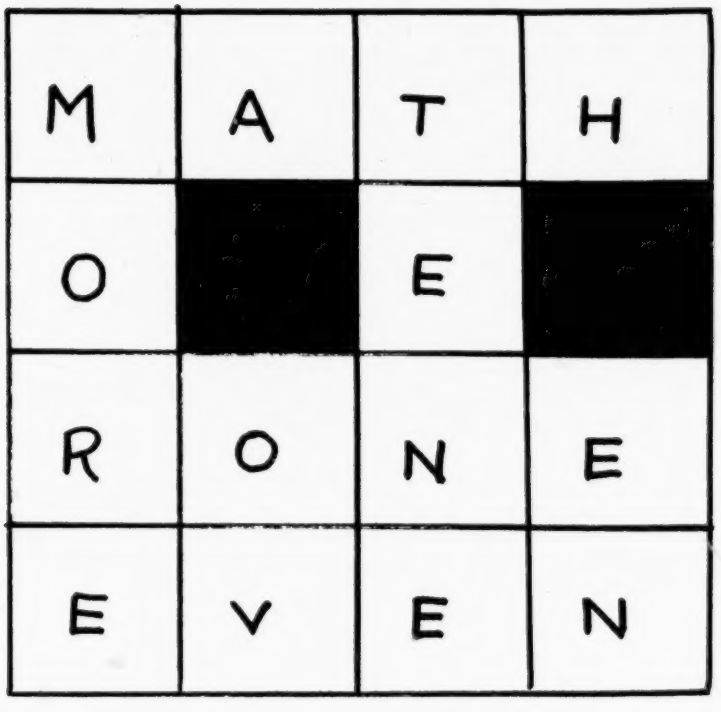


Find 5 math words

_____ _____

_____ _____

_____



Find 5 math words

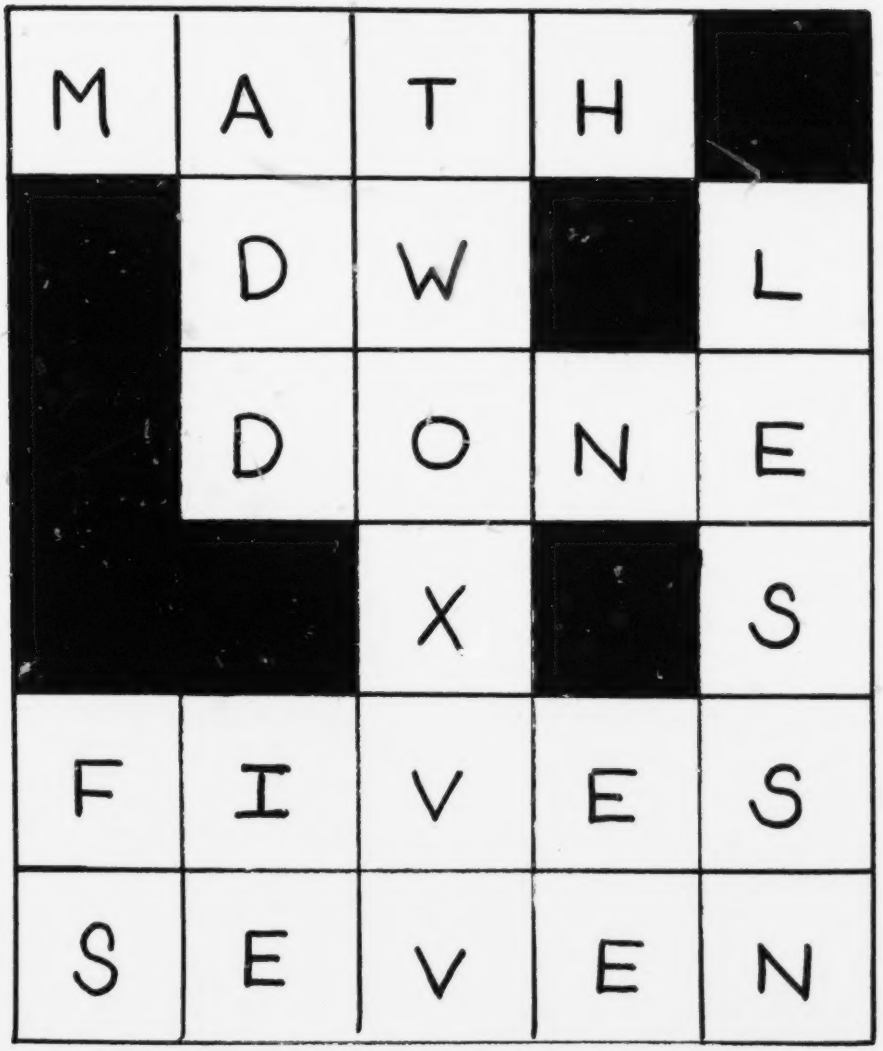
T	W	O	F
T	E	N	I
		E	V
N	I	N	E

Find 5 math words

_____ _____

_____ _____

_____



Find 7 math words

Solutions to Word Searching Activities.

Page 186

One
Three
Two

Page 187

Even
Five
Nine
One
Ten

Page 188

Even
Math
More
One
Ten

Page 189

Five
Nine
One
Ten
Two

Page 190

Add
Five
Less
Math
One
Seven
Six

Please send me

_____ **Happy Math at $9.95 ea** (add 25¢ for handling)

SHIP TO:

_____

_____

_____

_____

BILL TO: (If accompanied by purchase order)

_____

_____

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_____

Check Enclosed

P. O. Number_____

NOTE: CALIFORNIA RESIDENTS ADD 5% SALES TAX

Please send me

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BILL TO: (If accompanied by purchase order)

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Check Enclosed

P. O. Number_____

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SHIP TO:

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BILL TO: (If accompanied by purchase order)

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